THE IRON AGE

THURSDAY, MAY 18, 1893.

Speed on the Big Ferry.

As was expected, the latest ocean greyhound has already broken the transatlantic record. On her first eastern voyage the new Cunarder "Campania" accomplished the trip from Sandy Hook to Queenstown in the unprecedented time of 5 days 17 hours 27 minutes, being over two hours less than the best previous time. This is very good for a beginning, but it is pretty certain that it is by no means the utmost the vessel is capable of. New machinery seldom works to full perfection at the outset, and it is stated by her agents that the "Campania's" engines were not pressed to their full power. We may therefore expect her to lower her own record in the future. One thing is evident, that the limit of speed for ocean steamers is still far from having been reached. Each year recently has witnessed a diminution in the time of passage across the Atlantic, and it may safely be assumed that the progress will go on for some time to come. Even now another giant steamship is being built at Belfast which, with engines of 1500 more horse power than the "Campania," will, it is calculated, be able to compass a speed of 27 knots an hour. So even the resources of steam power in this direction are not yet exhausted. But when electricity is brought into play for driving sea-going vessels there is no saying where the potentialities of speed in ocean navigation may stop. It is quite within conception that we may yet be able to run over to Europe, transact our business in London, and get back again within the limits of the week.

It is now understood that the five handsome steamers which lately formed the United States and Brazil mail line are owned by leading men in the Standard Oil Company, but it is not known that any definite plan has been made for their future employment. It was hoped that under the Postal Subsidy bill the line would prosper. This second failure in attempts to develop South American trade is peculiarly unfortunate.

Another railway line is to be introduced into Palestine. The Syria Ottoman Railway Company and the Tyrian Construction Company have been formed in London for the purpose of opening up the rich country in the neighborhood of the Jordan Valley. The line will start from Haifa near the ancient Tyre, pass through the Jordan Valley and have its terminus, at any rate at first, at the city of Damascus.

The Allis Quadruple-Expansion Engine at the World's Fair.

[*With Supplement.*]

On the score of magnitude, at least, the 2000 horse-power engine exhibited by the Edw. P. Allis Company of Milwaukee, Wis., may be considered as the most important item in the class of steam engines at the World's Fair. As is now generally understood, it will be the leading feature of the immense power plant in Machinery Hall, and will be to the Columbian Exposition what the 1400 horse-power Geo. H. Corliss beam engine was to the Centennial. To the uninitiated its size and the ingenuity of its construction make it a thing of wonder and admiration; to the engineering profession it is an example of the latest improvements in stationary engine economy, in which the principle of compound expansion is carried to the extreme limit of practical application.

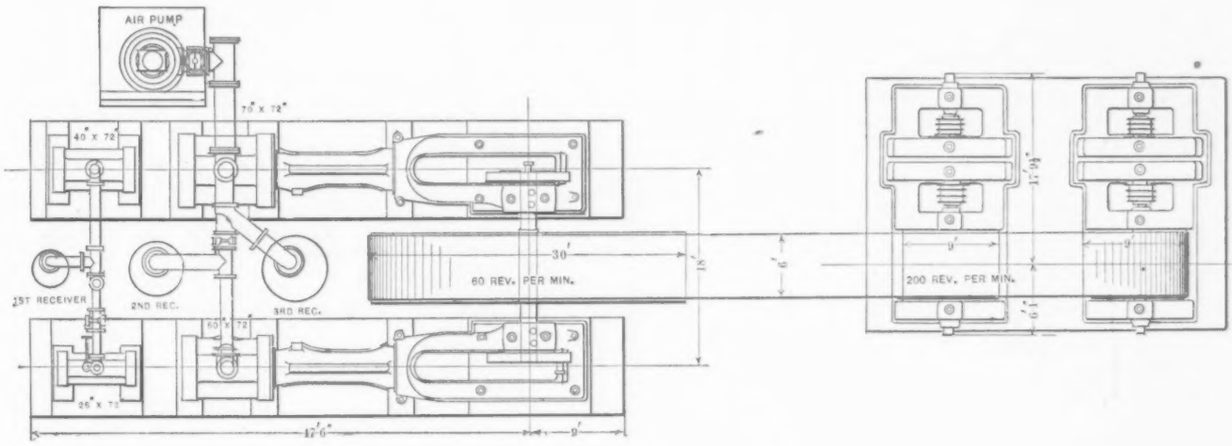


Fig. 1.—Plan.

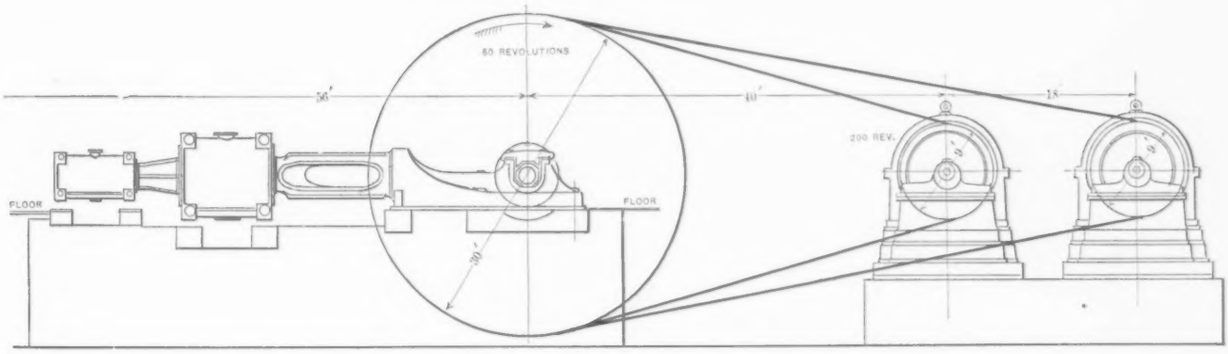


Fig. 2—Side Elevation.

THE ALLIS QUADRUPLE-EXPANSION ENGINE AT THE WORLD'S FAIR.

General Description.

The engine is of the Reynolds-Corliss type, and may be described by the apparently paradoxical designation of

"tandem cross compound"—or, more explicitly, as a twin pair of tandem engines thrice cross compounded, and therefore interdependent as well at cylinder as at crank end in the performance of its function of quadruple expansion. Unlike the Centennial engine, the duty to which it is applied is exceptional. In case of the former, the power was transmitted by means of spur gearing from the fly wheel to the main jack shaft, from which it was distributed throughout a large portion of Machinery Hall for driving the multitude of machines of all kinds using belt power. Any sudden great increase or decrease of load was, therefore, almost impossible on account of the diffusion. The duty of the Allis engine, however, is far more trying, as the entire power is concentrated in driving two machines only; and these of a character in which the possibilities of great and almost instantaneous changes of load render the most perfect and reliable regulation an absolute necessity. The transmission from the fly wheel is by leather belt 72 inches wide, as the Allis Company consider this system more distinctively representative of American practice, and, where admissible, far superior to any other. Of course, the many differences of opinion on this subject are based on the varied experiences of the users of the several systems in vogue; but this company express a very emphatic preference for the flat leather belting.

Directly west of the engine are located two Westinghouse incandescent dynamos of the largest size and capacity, they being for 10,000 lights each, of the standard 16 candle power, requiring 1000 horse-power each to run them at their rated speed of 200 revolutions per minute. The armature pulleys are of 9 feet diameter and 76 inches face, and as the engine fly wheel has a diameter of 30 feet and speed of 60 revolutions (5655 feet per minute periphery speed), the required armature speed is obtained direct. A peculiar feature of the drive, as shown in the plan and side elevation, Figs. 1 and 2, is that the two driven pulleys are directly in line and the belt of the further one runs on top of that next the engine. While this method is not uncommon, particularly in dynamo drives, it is unique in this instance, from the immense size of belt and amount of power transmitted.

The Steam End.

The general features of design and arrangement of parts of the engine may be seen by referring to the accompanying illustrations. The perspective view, which we print as a supplement, is from a photograph of the engine in position in Machinery Hall; and Figs. 1 to 10 are reproductions of the construction drawings. An illustrated description of the foundations was given in *The Iron Age* of April 6, 1893, so that further reference to this part of the subject is therefore unnecessary. The sizes of the four cylinders are as follows: High-pressure, 26 inches diameter; second cylinder, 40 inches; third, 60 inches; and fourth, or low-pressure, 70 inches. The stroke of the piston is 72 inches. In order to equalize, as nearly as possible, the two parts of the engine, the first and third cylinders are arranged tandem on the right, and the second and fourth on the left-hand side, thus three times crossing between the two sides. Each pair, of course, constitutes a complete engine, connected by quartered cranks. Between the two foundations, and below the floor line, are the three vertical cylindrical receivers shown in Figs. 1, 3 and 4, the respective sizes of which are relative to those of the cylinders from which they receive the exhaust. The condenser is located on the left of the low-pressure side, as shown in Fig. 3.

While it is the ordinary practice of the Allis Company to drive the air pump by belt from the main shaft, it was not found convenient in this case, and the apparatus was therefore made independent by providing it with a steam cylinder of the Corliss type, which will be more particularly referred to in its proper place. The arrangement of steam and exhaust piping is necessarily quite elaborate, in order to permit of the admission of live steam to any or all of the cylinders, and to make the different combinations of connections between the latter and the several receivers. Referring to the drawings, Fig. 2 shows a front side elevation of the engine and dynamos to the bottom of the foundations; also the method of belting from the fly wheel to the two armature pulleys. Fig. 1 is a plan of the same, showing the positions of the three reheaters and the independent air pump.

The Crank Shaft.

While the general design of the cylinders and their connecting girts and guides is similar to that ordinarily used for tandem engines of the modern Corliss type, it will be noticed that the main pedestal foot is extended to form a bed plate, or, more properly, a housing, which also furnishes the support for the outer end of the guides. The peculiar design of this casting—the arrangement of the very liberal amount of metal employed, which is a distinctive feature of this make of engines—affords not only great strength to resist the thrust of the pistons and the severe strains due to the angularity of the connecting rod, but also a very large amount of bearing surface

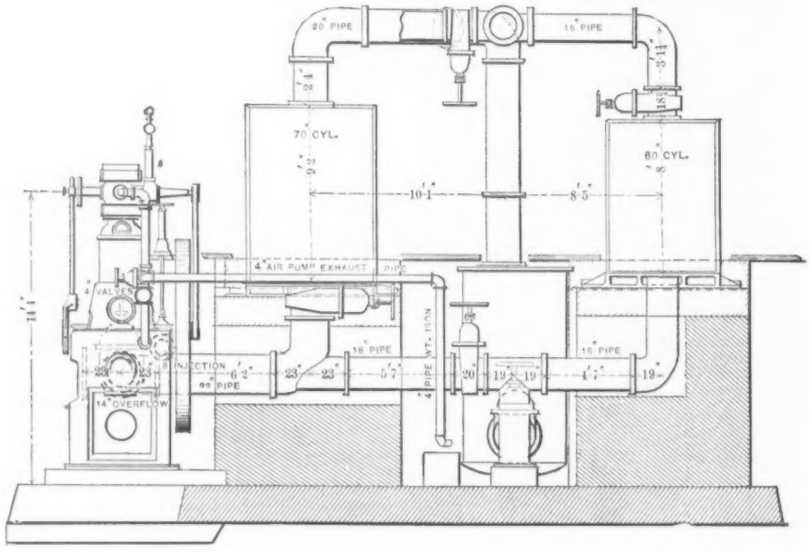


Fig. 3.—Cross Sectional Elevation through Cylinders, Receivers and Air Pump.

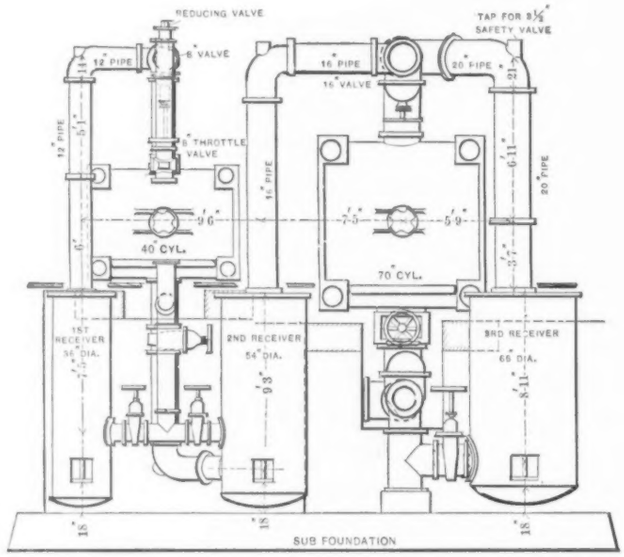


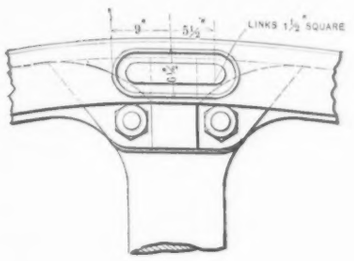
Fig. 4.—Receivers.

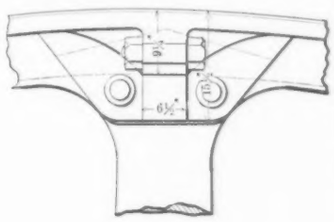
THE ALLIS QUADRUPLE-EXPANSION ENGINE AT THE WORLD'S FAIR.

on the foundations and great spread of holding down bolts. The heavy cored rib is carried around from the pedestal to the front side of the housing and slopes upward to join the cylindrical support for the outer end of the guides. The importance of this feature may be more particularly realized in the present application from the fact that the engine may at any moment be subjected to the tremendous

The Fly Wheel.

The fly wheel is 30 feet in diameter by 76 inches face, its total calculated weight of 136,000 pounds being distributed as follows: Rim 88,000, arms 30,000, center 18,000. It construction is clearly shown in the detail drawings, Figs. 5 to 8. The center is composed of two disks, 7 feet diameter, keyed to the shaft by two 3-inch steel keys 90° apart. Each of the 12 arms is made separate, and is fitted to its seat between the center disks, to which it is attached by three 3-inch through bolts and nuts driven tightly into reamed holes drilled through the solid metal with the parts in position. The nuts have a moderately fine thread and are screwed up tightly, thereby clamping the arms between the disks and affording a powerful friction hold, which greatly relieves the detrusive strain on bolts. The rim is composed of 12 segments, which are joined by means of internal flanges and eight through bolts and nuts 2½ inches diameter, the outer one of which on each side is driven into a reamed hole drilled from the solid. The outer end of the arms is inserted at the joint, being held between the heavy ribs by two 2¾-inch turned bolts and nuts, in reamed holes. As additional security the joints in the rim are strengthened by the use on each side of 1½ x 1½ inch wrought-iron links, let in flush and shrunk on to the inclosed lugs. The wheel was put together in the shop and turned on face and hub, after which it was taken apart for shipping and rebuilt in place on the shaft. The pistons, piston and connecting rods, cross heads, pedestals, &c., are all of the standard patterns used by the Allis Company and need not, therefore, be described.





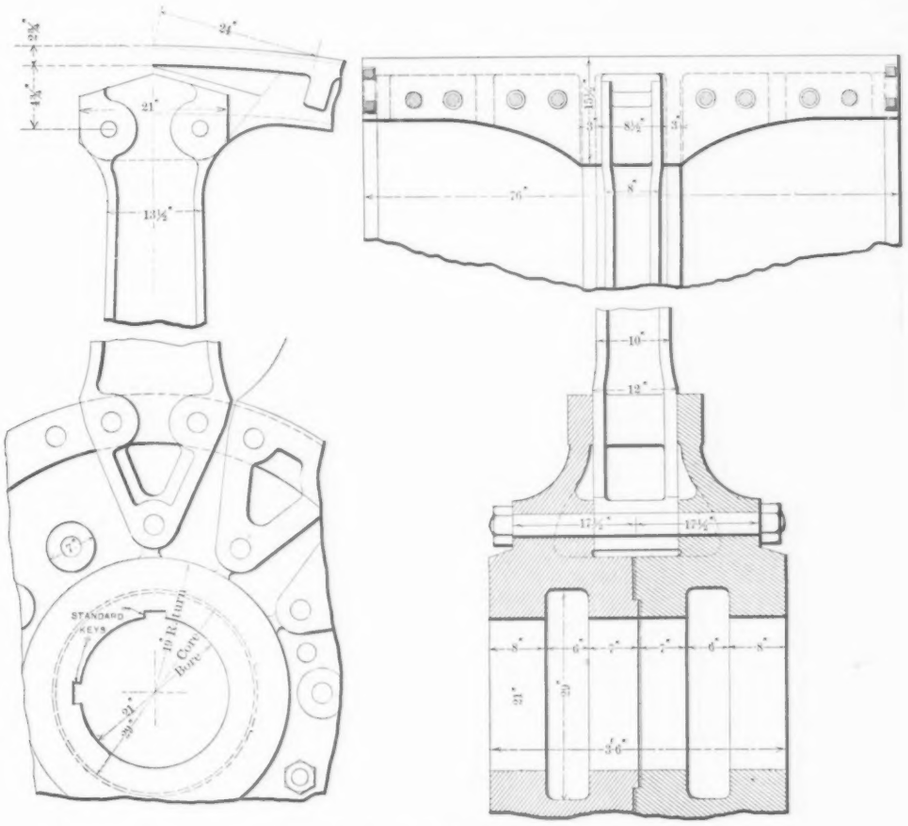


Fig. 5 to 8.—Details of Fly Wheel.

The Receivers.

The exhaust receivers are shown in position in Figs. 1, 3 and 4. The first, receiving from the 26-inch or high-pressure cylinder, is 36 inches diameter; the second, 54 inches; and third, 66 inches. All have a length of 10½ feet. They are of substantially the same construction, all containing a large number of symmetrically arranged brass tubes to act as reheaters. They are not, in any sense, intended for superheating, but merely to prevent condensation of the exhause steam in its passage from one to another of the cylinders, and to deliver it at the normal degree of saturation due to its reduced pressure. The exhaust passes through the tubes, which are surrounded by live steam at boiler pressure—the condensation from both internal and external spaces being removed by suitable traps. As the combined tube areas are relatively large, the passage of the steam through them is comparatively slow, and it is therefore thoroughly exposed to the heat of the live steam surrounding it.

As the entire system of steam and exhaust piping is very comprehensively shown in the perspective view and in

THE ALLIS QUADRUPLE-EXPANSION ENGINE AT THE WORLD'S FAIR.

and sudden increase of load which would result from a short circuiting of one of the dynamos, the effect of which would be to check almost instantaneously the reciprocating parts, moving at a velocity of 12 feet per second under an impulse of over 15 tons. Under such conditions it is readily seen how great would be the transverse strain to which the pedestal foot would be subjected and the serious nature of the results from failure to effectively resist it.

The crank-shaft body or wheel seat has a diameter of 21 inches, journals 19 inches and crank bearings 18 inches, with a total length of 18 feet. The crank disks are of cast iron and are 8 feet in diameter. The crank pins are 9 inches in diameter by 9 inches long.

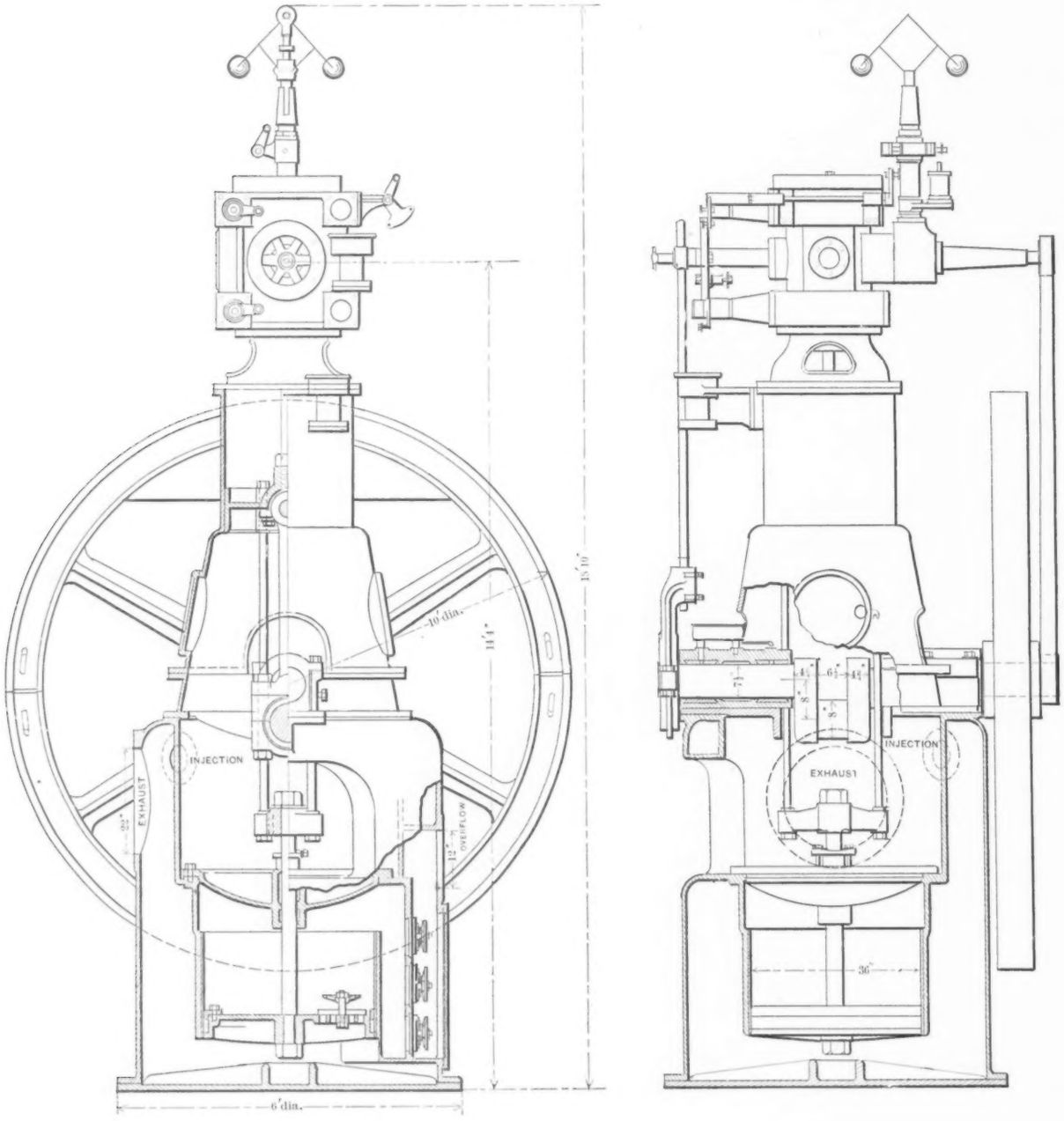
Figs. 1, 3 and 4 it will be superfluous to refer to it in detail. The location of the condensing apparatus is shown in Fig. 3, as also the pipe connections.

The Condenser.

The cylindrical jet condenser, Figs. 9 and 10, forms the base of the housing of a vertical Corliss engine, from the cross head of which two parallel rods, at both ends. Its construction and the arrangement of induction and delivery valves are clearly shown in Fig. 9.

The Valve Gear.

One of the most important and interesting features of the engine is a modification of the regulating gear, which was rendered necessary to extend



Figs 9 and 10.—Condenser.

THE ALLIS QUADRUPLE-EXPANSION ENGINE AT THE WORLD'S FAIR.

placed at an angle of 45° with crank shaft, are employed as a means of passing the latter and the cranks to connect with cross head of pump piston rod. The air-pump cylinder is centrally located in the lower part of the condenser—the latter, therefore, being annular in shape, having a 22-inch connection or exhaust opening in one side, and the injection admission at right angles with it—both being as near as possible to the top. The pump is single acting—the cylinder being open

the limit of maximum cut-off, by reason of the high rate of expansion. As, however, a comprehensive description of the device would be very difficult without a more extensive diagram than is practicable now, it must suffice to say that, by means of a supplementary eccentric, an independent motion is imparted to the cams, the effect of which is to allow of the entire range of cut-off from nothing to full stroke. In regard to the proportions used, the several cylinder and expansion ratios were

calculated by the method followed by the Allis Company, which is by laying out the hypothetical curve representing the expansion in a single condensing cylinder of the given volume of steam at the required initial and terminal pressures. The area inclosed by the diagram formed by this curve in connection with the admission and release lines is divided into an equal allotment of total pressures for the required number of cylinders. Mariotte's curve is used unmodified in this diagram and the necessary allowances made to compensate for heat transmission, &c.

The Electrical Starting and Stopping Device.

In the perspective cut is shown a feature which on opening day attracted quite as much attention as the engine itself, and was for a few minutes the focus for all eyes within range. This

is the device by means of which the big engine was made to respond to President Cleveland's pushing of the button at the grand stand, over 1000 feet distant. It is called the Electro-Automatic Engine Stop and Starter, and was attached by the manufacturers, the Electro-Automatic Appliance Company of Hartford, Conn., especially for the occasion. A 4-inch by-pass was attached to the main steam pipe under the platform, in the horizontal portion of which was placed the throttle. The latter, an ordinary gate valve, is operated by a screw stem and hand wheel. On the stem, just back of the latter, was placed a 6-inch sprocket wheel, the chain from which was driven from a similar wheel on the starter. By closing the valve, the machine was set for the opening at the closing of the electric circuit by the President's golden button. The operation of the starter upon the momentous occasion which signalized the formal opening of the great exposition was prompt and effective, though from the unusual importance of the result there were not a few of those upon whom rested the responsibility who breathed more freely after it was an accomplished fact. As a full illustrated description of the machine is given on another page of this issue, it will be superfluous to make further note of it in this connection.

Conclusion.

Judging from the nature of the duty to which it is applied, it is reasonable to expect that the engine will be kept in continuous operation under normal conditions during the usual number of working hours; and as an exponent of the type of multi-cylinder compound expansion engines, it is to be hoped that so good an opportunity of obtaining exact and unquestionable data on the subject of its comparative economy will not fail to produce practical results of great value to both makers and users of steam engines in the near future.

Smokeless Powder.

An important trial of smokeless powder was recently made at the great military camp of Aldershot in England, which has afforded additional proof of the utility of this substance. Artillery operations were conducted over an extensive area in order to test the visibility of guns using cordite as compared with black powder. Telegraphic communication was kept up between the batteries in action and the general commanding, who advised the frequent changing of ammunition. It was found that at long ranges it was almost impossible to discern the position of guns using the smokeless powder, whereas those using the old explosive were easily discovered. Meanwhile complaints are being made of the instability of the new powder in many quarters. That which has been manufactured in Russia has, it is stated, been found to be utterly useless after five months' keeping. The cause is some defect in the cotton which forms the basis of the powder, and all attempts have failed to discover a satisfactory way of preparing it. An inventor of a kind of celluloid made from straw is now offering his invention as a substitute for cotton, and first experiments are said to be satisfactory, although, of course, it may fail to stand the test of keeping. It remains to be seen whether this difficulty has been overcome in the preparation of a Southern inventor, which is now being tested by the Ordnance Department of this country.

Iron and Steel at the World's Columbian Exposition.

BY E. C. POTTER, CHICAGO.

I.

If there is one thing more than another that the United States should be proud of it is its iron and steel industry. Its vast deposits of iron ores of unequaled richness, its immense supply of fuels of all descriptions, its systems of land and water communication incomparable in extent and cheapness of carriage, all stamp this country as one supremely favored by nature and art for the successful manufacture of iron and steel.

Two years ago, amid much jubilation and self-congratulation, the United States won from its ancient rival, Great Britain, the proud position of first among the nations in production of iron, which place it has since held. Technical papers and periodicals, journals of scientific societies in all languages are filled with the achievements of American metallurgists, which bear testimony that first place was fairly and honestly earned by superior skill. Our blast furnaces are the admiration of the world; our steel works and mills are filled with those ingenious automatic and labor-saving devices which reveal our native Yankee cleverness. It is with this full realization of our greatness in this particular province that one enters the gates of the great fair confident that as the leading iron manufacturer of the world the United States will here shine with effulgent splendor.

Naturally one seeks first the exhibit bearing the world-famous name of Carnegie. This name is not in the catalogue; in none of the buildings does one find a pavilion bearing the name of the great Pittsburgh corporation; nowhere in the grounds is to be found a building devoted exclusively to the manifold products of America's largest and best-known steel manufacturer. Inquiry at headquarters develops the information—official—that the Carnegie Steel Company are not exhibiting! One turns, then, to find the display of our own local industry, which, bound by the triple ties of patriotism to city, State and nation, should undoubtedly be a conspicuous feature of an international fair located at Chicago. The Illinois Steel Company, however, is conspicuous only by its absence. In the same category are nearly all the prominent manufacturers of the country. Bethlehem, our American Essen, gives ample evidence of our recently developed abilities in the direction of weapons of offense and defense, heavy forgings, &c., in a striking manner (this is not intended as a punning allusion to the big hammer). Old Cambria, the parent and training school of many of our great works, does its full share in upholding the dignity of the industry. The Crescent Steel Company and Singer, Nimick & Co. of Pittsburgh, together with several smaller concerns, display large and interesting collections of their products. All honor and credit is due to the few who had interest and appreciation enough in the greatest exposition ever conceived to do their part in representing the nation in its greatest industry, but nevertheless the American iron and steel industry is very inadequately represented, a fact more strongly emphasized by the magnificent displays of other nations. The result is keen disappointment to the patriotic citizen who knows his country's abilities in this direction.

It strikes the average person that this industry owes something to the people of this country. They, through their national legislature, have for decades thrown about it the fostering protection of an ample protective tariff, with the results we see. And now, when the nation is putting forth its best endeavors to show to the world at large to what perfection our civilization has attained, we find the principal representatives of our chief industry indulging in an aggravated fit of sulks. Such things may be possible with piano makers, but iron and steel men are supposed to be made of sterner stuff.

It is not in the province of this article to inquire into the causes that led to this sublime indifference to our country's good showing; one cannot conceive of any circumstance or combination of circumstances that would excuse the entire absence of our leading steel manufacturers on such an occasion as this. The lack of sufficient space is not a valid or acceptable excuse. If one cannot get the desired 1000 feet one must do the best he can with 500; but let him be present in some shape and contribute to his country's glory to the fullest extent that circumstances will permit. That is his plain duty. No matter how limited, an exhibition is an evidence of the exhibitor's good will and appreciation of the occasion. The people of this country expect to see our great steel works represented and they are going to be sorely disappointed and chagrined at our poor showing in this department.

There is a little poor consolation in the fact that the showing of Great Britain is poorer and more attenuated than ours. That country, for centuries the leading producer of iron in the world, and to-day covering a wider range in its export trade than any other, the birth-place of the Bessemer and many other notable processes of manufacture, is represented by the exhibits of three firms, the three together not equaling in size, interest or extent the exhibit of a single German firm adjoining them. It is whispered that the pernicious McKinley bill is responsible for this. That famous act may have had such an effect upon our British friends, but fortunately it has not deterred other nations of Europe from participating in the iron and steel exhibit in a manner that calls for unstinted praise.

To the German Empire we most heartily and cordially give first place in the iron and steel exhibit of the Columbian Exhibition. In this, as in every other department of the great fair, do the exhibits of Germany command universal admiration for their extent, completeness and artistic beauty, representing, as they very evidently do, months of painstaking thought and labor, and a lavish expenditure of money. Their energetic and ambitious young Emperor seems to have infused his subjects with a large share of his enthusiasm, and they have responded in a most commendable manner. When we reflect that every item of their exhibits must first be transported to their sea coast, thence across the Atlantic Ocean, and then 1000 miles inland to Chicago, making a total journey of between 4000 and 5000 miles, we realize that Germany appreciates our fair and has put forth her best efforts. We, on our part, take this opportunity to assure the German people that we appreciate most deeply the animus that has expressed itself in their grand display. In the face of hostile tariff legislation which seems to

have deterred other nations, they have come forward without thought of remuneration and taken the place in this Congress of Nations which is theirs by right of their leading position among civilized peoples.

Sweden promises to have a full and varied display, which is unfortunately and unavoidably delayed. France and Belgium take no part in the iron and steel department. One cannot but regret the absence of such important and famous works as Le Creusot, Terre Noire, John Cockerill, and numerous others.

(To be continued.)

The Westinghouse Interests.

The annual meeting of the stockholders of the Westinghouse Electric & Mfg. Company of Pittsburgh was held in that city on Wednesday, the 17th inst. The annual report of the concern has been made public, and one of the interesting features of it is the announcement that new and extensive works will be erected at Wilmerding very close to the present shops of the Westinghouse Air Brake Company. Reference to the building of new shops is made in the report as follows:

Your directors have been brought face to face with the fact that the business of the company has outgrown the present capacity of their factories, and that large savings could be effected if the manufacture were carried on in new works equipped with the latest devices for handling their product by machinery.

In view of the favorable result of the past year's business and of the volume of orders in hand, and the future outlook, your directors have not hesitated to accept a proposition from the East Pittsburgh Improvement Company to sell to your company 23 acres most favorably located with reference to railway facilities. The improvement company have agreed to erect on this site buildings and works according to the plans and under the supervision of the officers of your company, and to sell them to the company at their actual cost, not, however, to exceed $500,000 above the price of the land, and have agreed to take pay therefor in quarterly payments of $25,000 and interest, beginning Jan. 1, 1894. Your officers have estimated that the savings to be effected by the manufacture of its products in the new works will, on a most conservative basis, be more than double the amount of the quarterly payments. Thus these new and complete works will be acquired without the expenditure of fresh capital, without taking into account the manifold business advantages that will arise from the centralization of its manufacturing operations.

Concerning the business of the company for the past year the report says:

The earnings of the year amounted to $1,604,533 73. This is after charging to operating expenses the following amounts: $84,747.31 for alterations and additions to buildings; $155,484.87 for maintaining the machinery and tools in order, and $58,188.86 for interest and discount.

The year begun with large orders, but with only moderate manufacturing capacity and appropriate stock of materials on hand, so that the above earnings were made under unfavorable circumstances due to the fact that the capacity of the works and the material in stock and in process had to be more than doubled during a steadily increasing press of business.

The report concludes as follows:

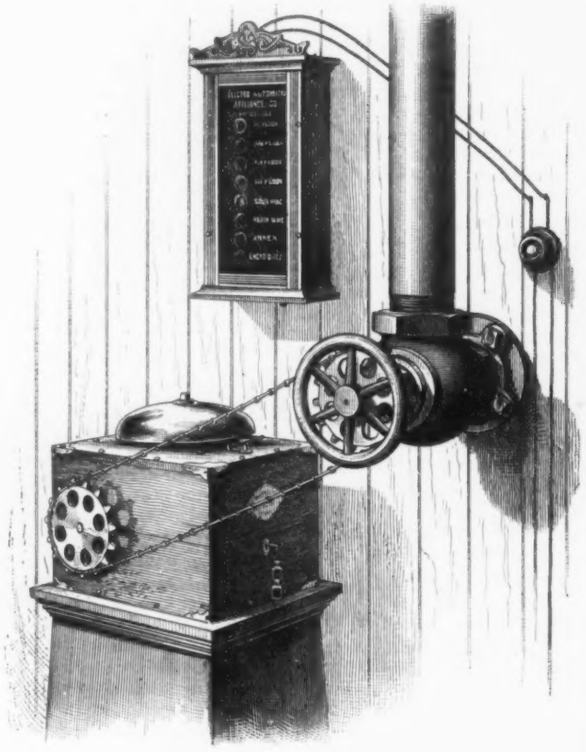
Although the profits of the business might have justified the payment of dividends on all of the stock of the company, the directors have thought it wise to pursue a very conservative policy, especially in view of the large expenditures required during the past year for machinery and material and of similar expenditures which the present prosperous condition of the company's business may make necessary in the near future. Both the results and the prospects are so encouraging that the directors believe the stockholders will uphold them in a course which places the company in a position of undoubted financial strength, and which will assure the permanent continuance of dividends when once begun.

The Electro-Automatic Engine Stop and Starter.

It would be but a useless repetition to refer at length to the importance of providing means for quickly controlling the motive power used in manufacturing establishments. The subject has been frequently presented in these columns, both in the abstract and in connection with various devices intended either primarily or incidentally to accomplish this object There are numerous different methods employed more or less successfully, in some of which the use of the electric current constitutes an essential feature.

During the past decade the "push button" has become a universally popular instrument. From the amateur Kodak fiend taking his snap shots to the President of the United States starting the 2000 horse-power engine a quarter of a mile distant, this apparently innocent little device is the unfailing medium for transmitting the will of the operator. The electro automatic apparatus shown in the illustrations is operated by a system of buttons and wiring, but its most important and distinctive characteristic lies in the fact that it not only signals the engine room, but it performs automatically the service required without requiring any assistance from the engineer. In other words, in case of emergency the engine may be stopped instantly from any part of the building by a simple pressure of the button nearest at hand, while at the same time the ringing of the gong notifies the engineer of the fact.

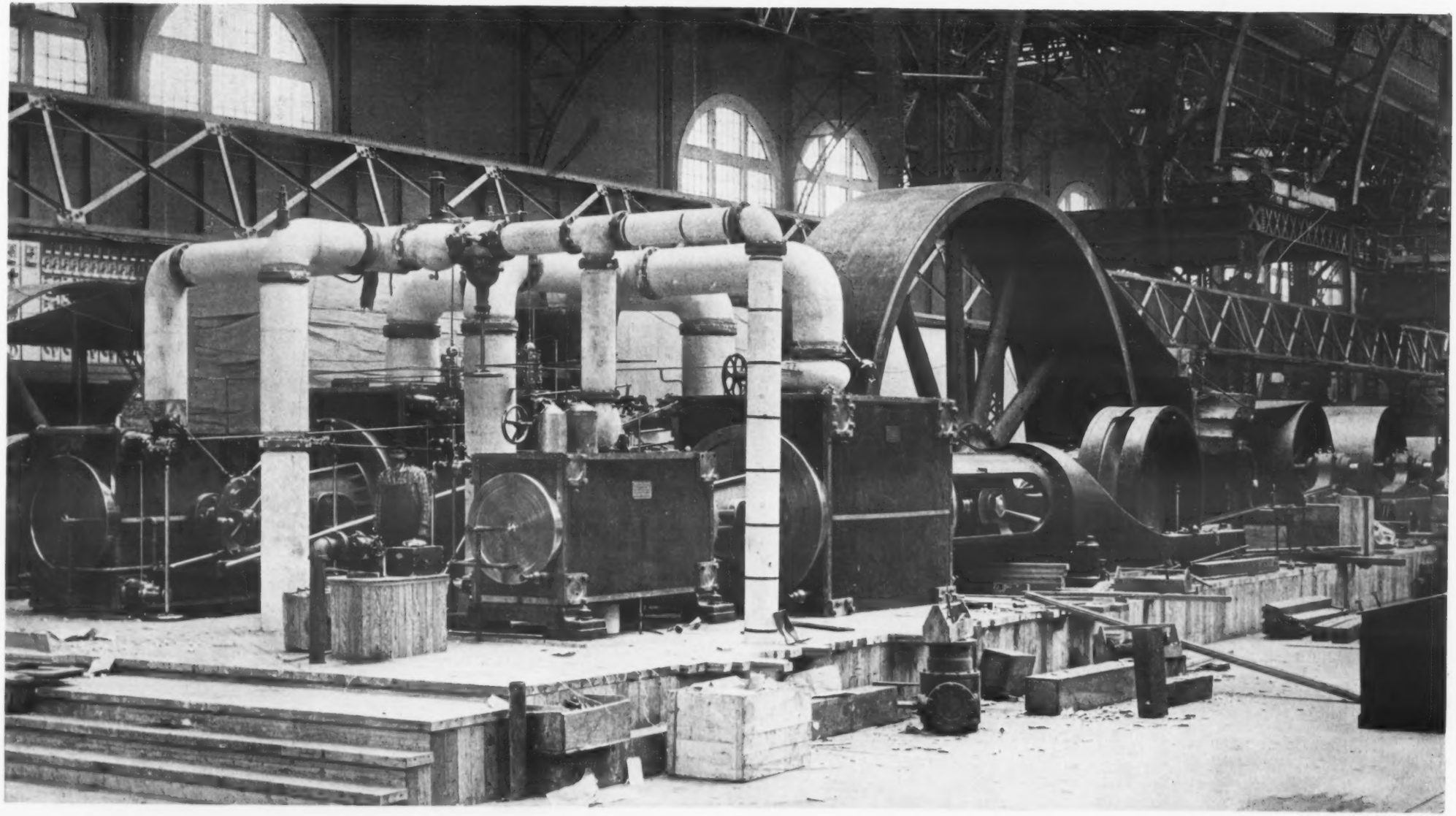
The use of the machine for starting instead of stopping the engine, as was the case at the exposition, does not involve any change in the mechanism, but simply a reversal of position of the apparatus with reference to the throttle valve. In the perspective cut the machine is shown connected to the engine throttle, while above it is placed an annunciator for indicating the location of the button from which the release was made.



THE ELECTRO-AUTOMATIC ENGINE STOP AND STARTER.

The drawings, Figs. 2, 3 and 4, show the details of construction, which, it will be observed, is extremely simple. In the drum f is coiled a powerful spiral spring similar to an ordinary clock spring. The drum is secured to its shaft a, upon the outer end of which is the sprocket wheel e. The spring is attached at its inner end to a sleeve on the bearing f^2; while the outer or free end is secured to the inner periphery of the drum. Upon the side of the latter are cut the ratchet teeth f^1, which are engaged by the sliding bar or pawl k, which holds the drum in position after winding the spring. The lever i, fulcrumed at i^1, is provided with a powerful spring, i^2, whose function is to force the free end of lever away from the drum. A tumbler, l, by means of the slot or camway l^1, engages the pins in the end of the lever, and the arm l^3 of the tumbler is retained in its set position by a small lug on the armature m of an electro-magnet. This holds the lever i in position against the tension of the spring i^2, and it is apparent that if the magnet be excited by closing the electric circuit the armature will be attracted and release the tumbler, when the tension of the spring i^2 will throw the lever i to the left with considerable velocity. The pawl bar k, Fig. 2, is seen to be forced against the ratchet teeth of the drum by the spiral spring concealed in the inner bearing. There will also be noticed a notch, k^2, and pin, k^3. The throttle valve is indicated at n, and the chain connecting its sprocket wheel e^1 with e is shown by the dotted lines. The other parts of the machine will be better understood from a description of its operation.

Considering the throttle valve in the opened position (by turning its hand wheel for opening, the motion is trans-



THE ALLIS QUADRUPLE-EXPANSION ENGINE AT THE WORLD'S FAIR.

mitted to the drum through its shaft a and winds the spring, thus setting the machine), if the electric circuit be closed by pressing the button, the armature is deflected and releases the tumbler l, which allows the latter to swing forward on its pivot and free the end of lever, i, when the latter is thrown forcibly outward by the tension of the spring i^2, and by striking the pin k^3 in the pawl bar disengages the latter from the drum rachet and permits the spring to unwind, which it does with considerable velocity. This, of course, turns the valve stem n^1 and closes the throttle. In disengaging the pawl bar from the rachet, the former is carried forward by the lever i until a notch, k^2, engages the pin o^2, which retains it in that position. As soon as the drum begins to revolve the flanged nut g (which is prevented from turning by the guide bar h, Fig. 4, engaging one of the slots g^2) moves toward the drum, and coming into contact with the lever i, Fig. 3, forces the latter over into the set position, while at the same time the pins in the lower end re-enter the camway in the tumbler and throw it back until the arm l^3 depresses the armature and passes the lug, when the armature will be drawn back to the open position by the spiral spring back of its fulcrum and lock the tumbler and lever i.

Thus it is evident that the machine may be considered as absolutely automatic, as there is no manipulation required for the setting beyond what is necessary without it in starting the engine; and as to the release for stopping the engine, it consists in pressing the button.

A dry battery, permanent in its action, is part of the outfit. The milled-headed spring pin p^1 is provided for the purpose of releasing without the use of the electrical mechanism. This is effected by forcing the pawl bar out of engagement with the drum ratchet and holding it in that position until the motion ceases. The entire machine is inclosed in a handsome hardwood box which is surmounted by a silver-plated gong of 6 inches diameter, which rings upon the release contact being made. It is obvious that the device is not limited in its application to the purpose described, as there are many other uses to which it is quite as well adapted. For instance, it may be a valuable adjunct to a system of cut-off couplings, which it could be made to release as promptly as it would stop the engine. Also it might be made to control the valves of an extensive steam heating or water supply system from a central point. The machine is being introduced by the Electro-Automatic Appliance Company of Hartford, Conn., and a local company is now being organized in Chicago with headquarters in the Commercial National Bank Building.

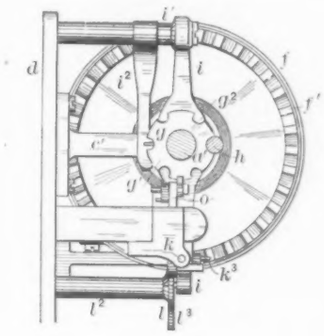


Fig. 4.

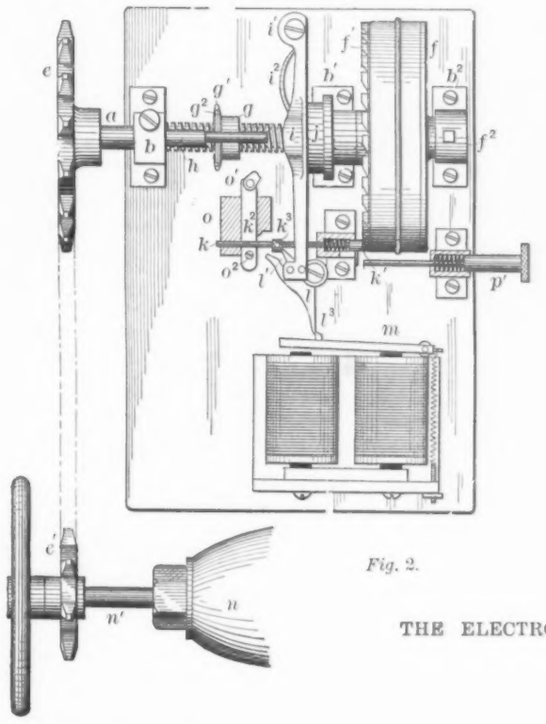


Fig. 2.

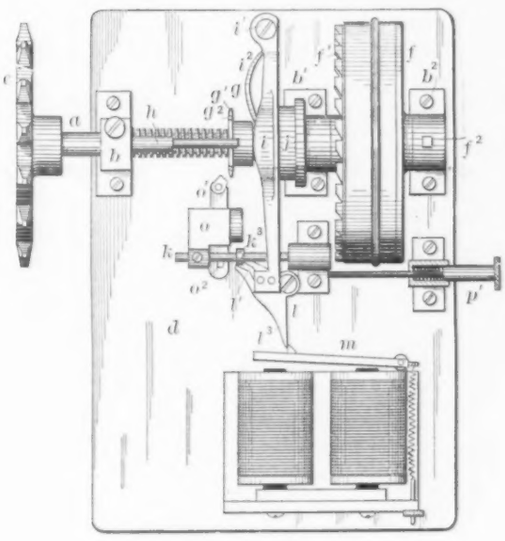


Fig. 3.

THE ELECTRO-AUTOMATIC ENGINE STOP AND STARTER.

In order to prevent the momentum of the revolving parts from jamming the valve against its seat the motion is checked by the lever i coming in contact with a rubber buffer spring, j, and the adjustment is obtained by releasing the nut g from the guide bar and setting it in the required position to cause the cessation of motion at the instant when the valve is properly closed. The guide bar is then made to engage one of the slots in the flange which is nearest in position. In setting the machine by opening the throttle, of course the nut is screwed outward, and in passing the stop slide o^1 the latter is depressed by the flange, which causes the pin o^2 to disengage the slot k^2 in the pawl bar and allow the latter to be thrown into engaged position with the drum ratchet.

The exchange question and the depreciation in value of the silver rupee seem likely to lead to grave results in India. The following extract from a private letter received from a Government official in that country depicts the situation as it now exists. Writing April 12, he says: "The great question agitating all minds out here just now is that of 'exchange.' It is assuming a most serious aspect; and, as the Finance Minister said last month in his budget statement, it is not unlikely that we may soon be face to face with the greatest financial crisis of the present century. It is strange that the whole financial arrangements of the Empire should be now hinging on the rise or fall of the rupee. A drop of one penny means the loss of millions sterling, and *per contra* a rise of a penny. We are waiting the result of the Currency Commission, but have little hope of any real benefit from its investigations. We are also very anxious to know what America is going to do in the matter of silver purchasing. So far as we Government officers are concerned it seems certain that some relief will be granted very soon; it has been practically promised. But anything done in this direction will, of course, mean additional taxation, and one rather grudges this. I don't envy the Government of India at the present moment. Its difficulties and perplexities are many and great."

The Government crop report for May shows the condition of winter wheat to be 75.3 per cent., against 77.4 a month ago and 84 a year ago. The average condition of the six principal wheat States is 68.3, against 74.2 a month ago. On the whole, the report is considerably better than had been anticipated. It does not indicate what the crop will be, as it gives no idea of the acreage of the crop.

Krupp's Workmen.

An interesting account of the methods pursued by the proprietors of the great Krupp foundries, at Essen in Germany, for the benefit of the workmen employed there and their families, is given in a recent number of the "Annals of the American Academy of Political and Social Science." The following is an abstract of the paper: "The Krupp works employ 16,000 men, and with their families, numbering over 50,000, constituting the bulk of the population of the town of Essen, while over 3000 are located at various branch works, and the total number benefited by their numerous charitable and philanthropic enterprises is estimated at 25,200 workmen, and, with their families, 87,900 persons. The Krupps themselves say that their numerous institutions for their workmen and their families are based first on their own business interests. Their successful efforts to raise the condition of their workmen have been made in various ways. The Krupps have built over 4000 houses—from frame dwellings of two rooms, renting at $15 a year, up to six-room houses, renting at $80 a year; they have expended over $3,000,000 on them, earning about two per cent. on the investment, but this, with much more, has been spent in benefiting the working population in other ways.

The co-operative stores, managed by the Krupps at their own risk, include 15 retail grocery stores, nine branch stores, with one main store for general merchandise, a shoe factory with three stores, a hardware store, a mill and bakery with six bread stores, a slaughter house with seven retail meat stores, two clothing establishments, seven restaurants, a wine store, an ice company, a coffee house, a brush factory, a laundry, a weekly market for fresh vegetables, a coffee-roasting establishment—in them nearly 500 persons were employed, widows or daughters of workmen. There is a boarding house for the unmarried workmen, where lodging and food are supplied at 20 cents a day. In 1870 Alfred Krupp built a hospital for sick and wounded soldiers, and since the Franco-German war it has been used for their workmen and their families—they are cared for at the price of 38 cents a day for men, 30 cents for women and 25 cents for children. There is a large bathing establishment, where 6000 free baths were given last year, and bath tickets are sold for 2½ cents apiece. The insurance funds against accident and death and for pensions have been largely supplemented by the Krupps, in addition to the strict requirements of the German laws. Primary and advanced and technical schools are maintained by the Krupps, who say that all this is done to enable them to extend and improve their work by making their workmen sharers in their prosperity.

Plans for the location of the bridge across the Mississippi above New Orleans have been completed. The length from shore to shore will be 2290 feet; central span 1037 feet.

Mr. Montgomery, geologist to the Government of Tasmania, has recently examined a large copper-pyrites deposit at Mount Lyell in that island. He estimates that the portion already opened up, which is about 300 feet long by 200 feet deep, will supply many years' work on a large scale. As the pyrites, when roasted, is almost pure oxide of iron without silica, no iron flux will be required for smelting, but there is a possibility of dry silicious ores of fair silver or gold value being taken to smelt with the copper.

The Lathe Chuck in the Patent Office

There is probably no tool or appliance in the machine shop which is used in so many different forms and for so many different purposes as the lathe chuck. It is used on the lathe, on the screw machine, on the boring mill, the drilling machine and the tapping machine. It varies in size from that capable of holding the large line shaft pulleys to that of the watchmaker, no larger than the end of your little finger.

Chucks may be divided into two general classes: 1, those suitable for the general run of machine shop work; and, 2, those designed for special work. It will be seen at a glance that the first is a restricted and limited class, while under the latter will be found all of those chucks designed to meet some particular want or some particular service, theretofore accomplished by some roundabout method, in a better, more expeditious and more satisfactory manner. To the former class we will give more particular attention.

The first lathe chuck for which a patent seems to have been granted by the office appears to be a very creditable affair. It bears a date of July 18, 1840, and was of the scroll-plate type. It consisted of a face plate having four radial grooves for the reception of the jaws; a hub extends backward from the center of the plate, internally and externally screw threaded, and a flange also extends backward from the edge. Each of the jaws consists of a main body running nicely in the undercut groove of the face plate; outward from this body extends the jaw proper for engaging the work, and on the under side of the body teeth project, which are engaged by the thread of the scroll plate. The latter plate slides on over the hub of the face plate, and its outer edge meets the backwardly extending flange of the face plate, presenting a smooth and finished appearance. The scroll plate is held in place by a washer screwed on the outside of the hub. The chuck may now be screwed on the live spindle of a lathe, the thread of which will engage the internal thread of the hub of the face plate. The scroll plate is intended to be operated by hand and therefore the pitch of the scroll is made very slow.

In 1855 a patent was granted for a two-jaw chuck, both jaws being operated by a single spindle bearing a right-hand thread at one end and a left at the other. The spindle is held against endwise motion by a collar at each end. This patent seems to be the first to show a right and left threaded spindle for the operation of chuck jaws.

Later in the same year a patent was granted for a chuck of the circular-rack type. It consists of a face plate bearing three jaws running in grooves and operated by screws. Each screw bears a small bevel pinion and the three are operated together by a circular rack running in a groove in the back plate. On the outside ends of the screws the usual heads appear, to be engaged by the wrench.

Not long after this we find the first of the swinging-jaw chucks, in which the jaws are pivoted to the face plate and are moved toward and from the center by cams or other similar or equivalent mechanism.

In looking over all of the chucks that have been patented since those early days one is struck by the fact that most of the later ones seem to be mere modifications and improvements on these four species. But by no means have inventors confined themselves to these varieties; they have gone into other fields than the mechanical for means of holding work while being operated upon. Fig. 1*a* and 1*b* shows a chuck which depends on the principle of the electro-magnet for its operation, in which the work acts as the armature to complete the magnetic circuit. By reference to the figure it will be seen that the face plate of the chuck consists of two separate pieces of iron, which, being connected to the cores of the coils constitute the two poles of the magnet. The outside shell is made of brass and connects the front and back armatures, the latter of which also acts as the back plate of the chuck. On the outside of the shell, and insulated therefrom and from each other, are two grooved brass rings, which are connected by insulated wires to the coils of the magnets. Upon these two rings bear the brushes connected to a suitable dynamo or battery. When thus connected up it will be seen that the apparatus becomes a powerful electro-magnet, and if any piece of iron or steel be placed upon the face plate it will be held with great force until the current is broken. This would seem to be a very ingenious mechanism, but the writer doubts if it ever came into any remarked degree of popular favor.

Another patent describes a pneumatic chuck, which consists of a hollow cup, on the edge of which is placed a gasket; from this cup runs a tube back through the spindle to the outer end, where it is connected to a pump which may be inclosed in the spindle, or connected thereto by suitable stuffing boxes and piping. The work is placed against the face of the chuck and the air from the interior is exhausted by the pump; the atmospheric pressure then holds the work in place. This chuck is intended to hold a watch case while being worked upon, and could not probably be used for much heavier work, if, indeed, it has proved itself useful for the purpose for which it was designed.

To pass from the method of operating chucks to the various details and forms, let us first consider the eccentric chuck. This has been the subject of many patents, and it would not seem that the inventor is as yet satisfied with his production, for he still pursues the phantom—a perfect eccentric chuck. One patentee mounts his chuck on a slide screwed on the live spindle and moves the chuck bodily to and from the center by a screw fixed in the slide and running through a nut fastened to the chuck. Another pivots the face plate to the back plate, and by means of a slot in the back plate in the form of an arc of a circle, of which the center is the pivot, and a bolt which projects from the face plate through the slot, the face plate may be moved over the back plate to any desired degree of eccentricity within the limits of the capability of the machine, and there fastened. Another has a two-jaw chuck and a right and left threaded screw to operate the jaws. This screw is held in place by a detent engaging a neck in the middle of the screw. Now, to adjust the jaws so that they will hold the work eccentrically, it is only necessary to slide the detent to one side or the other in a slot in the body of the

chuck provided for that purpose, and to fasten it in the right position.

Fig. 2 represents a somewhat more complicated form of eccentric chuck, in which the main body A screws upon the live center of the lathe. The next plate B swings upon the screw *h* as a center and is held in place by the strap *e* integral with A. It is operated by the screw F, which passes entirely through the chuck body and is engaged by a small chuck wrench. The jaw plate C is held by the screw N and its strap K, being drawn up by the bolt L. Nice adjustments are accomplished by use of the worm M fastened to the plate C and these the outside portion of the jaws is made removable from that part which is engaged by the screw beneath the face of the plate, so that it can readily be taken off and put on in the opposite direction to engage various sized pipes, &c.

In 1890 an inventor conceived the idea of doing away with some of the troublesome labor of adjusting heavy work on large face plates and brought out the face-plate jaw shown in Fig. 3, which it will be seen from the drawing is attached to the face plate by bolts at either end, passing through holes in the lugs *e*.

the tap by reaching the bottom of the hole to be tapped frequently breaks tools unless provided with these safeguards.

Many little details are now being studied in the manufacture of chucks, examples of which are the use of loose faces on the chuck jaws of screw machines and in the use of a separate adjustment of the several faces of each jaw as well as each jaw as a whole. Nice adjustments for the taking up of wear are also now given the attention that they properly demand, in order to make a tool that the workman would like to use.

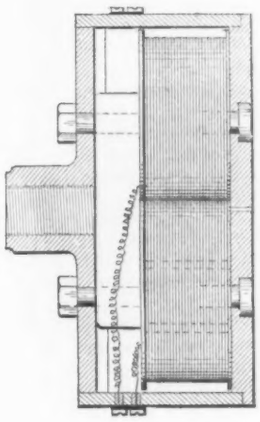


Fig. 1a.

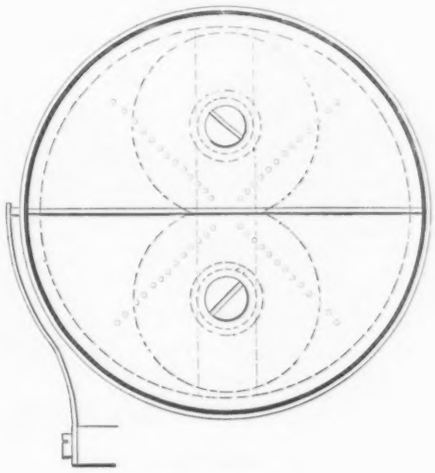


Fig. 1b.

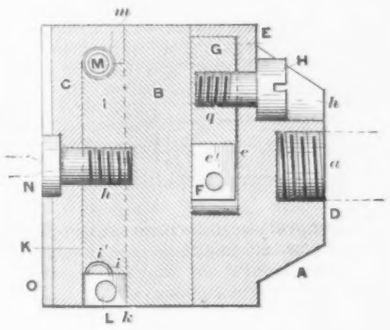


Fig. 2.

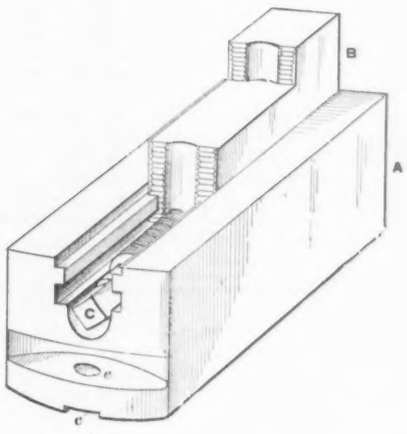


Fig. 3.

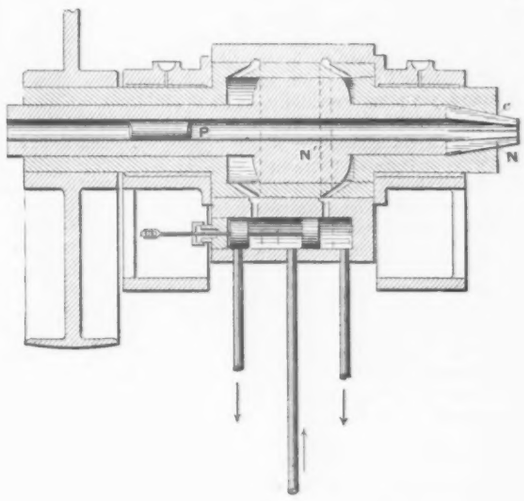


Fig. 4.

THE LATHE CHUCK IN THE PATENT OFFICE.

engaging the worm wheel in the projection I of the plate B. The design in this case seems carefully studied and adapted to wear well and hold the work firmly.

So far we have given our attention to chucks adapted to grasp the work from the outside, but work is not always solid and gripped in this way; sometimes the work is hollow, and the need of chucks to hold such material as car-wheel tires and other hollow articles while the exterior surface was worked brought forth chucks which expand the jaws to engage the work. Many patents have also been granted inventors for reversible chuck jaws for the ordinary lathe chuck. In

Several inventors have found it desirable to insert a friction connection in a chuck, so that if the cut should run in too deep, instead of breaking the tool or prying the work from the chuck, the frictional connection will allow the chuck to stop while the spindle continues to rotate. In one of these the time at which the chuck will stop is regulated by means of a strap attached to one of the portions of the chuck and passing around the other member of the chuck, the tension on which may be varied by means of a bolt so that the chuck will cease to rotate at any desired increase of resistance. These forms are particularly useful in tap chucks, where the sudden stopping of

There are many interesting chucks that are capable of being operated while in motion to be found as applied to the screw machine. To one of these attention is invited in view of the novel and ingenious construction there shown. A vertical longitudinal section is shown in Fig. 4. In this case liquid under pressure is used for the operation of the chuck. In the position of the parts shown in the figure, liquid is admitted to the left of the piston N'', thus forcing it to the right and the reduced portion N into the taper hole *c* to grasp the rod, a portion of which is shown at P. When it is desired to release the chuck the valve is moved to the right and the liquid enters the right-hand end of the

cylinder, withdraws N and releases the chuck so that a new length of rod may be fed through.

There have been a great many interesting and efficient drill chucks patented, but it is beyond the scope of this article to mention them.

Much has been accomplished by inventors in the work they have done on the lathe chucks. If in the short space of 40 or 50 years such an advance has been made, it seems as though it would be a difficult thing to predict where invention will leave the chuck at the end of 40 or 50 years more. Who can tell? Perhaps then there will be no such thing as a lathe; perhaps by that time the world of mechanics will have advanced so far that the lathe, the boring mill and the milling machine will be considered relics of the past. But in all seriousness it would seem as though having seen a desired end to be attained, the mere application of a little inventive genius was all that was necessary in order to accomplish that result.

The Brown & Sharpe Automatic Screw Machine.

The engraving here presented represents a new automatic screw machine built by the Brown & Sharpe Mfg. Company of Providence, R. I. The spindle and boxes are of steel and the latter, together with the front bearing of the spindle, are hardened, ground and lapped. The front box is provided with means of compensating for wear. The thrust is taken at the rear end of the spindle; the bearing parts are hardened and ground. The hole through the spindle is $\frac{13}{16}$ inch in diameter. The chuck that forms a part of the spindle has three adjustable jaws. The turret has four holes $\frac{5}{8}$ inch in diameter and revolves vertically on the side of the turret slide. The movements of the turret slide, the changing of tools, the cutting-off tool, the feeding and holding of stock and the reversing of the spindle are controlled by cams. These cams, with the exception of the "lead," or turret slide, and cut-off cams, are adjustable. The lead and cut-off cams are made from castings that require but little finishing. Rules and diagrams for laying out these cams are sent with each machine. The return and change movements are rapid and by the accurate timing that the machine admits of, work can be rapidly done. The feeding mechanism feeds any length to 2 inches and any length to $1\frac{1}{2}$ inches can be turned. The weight of the machine is 720 pounds and the floor space occupied is 21 by 39 inches.

Congratulations are indulged at Montreal, now that the controversy with the United States on the subject of the rebate on canal tolls is terminated and that the embargo on Canadian vessels at the Sault is removed. One consequence will probably be an increase in the quantity of grain reaching Montreal for export by way of Ogdensburg. From that point a large distributing trade over the New England States is carried on. Formerly nearly 20,000 tons of grain were transferred annually at Ogdensburg, or about 6 per cent. of the total quantity which passed down the Welland Canal to Montreal.

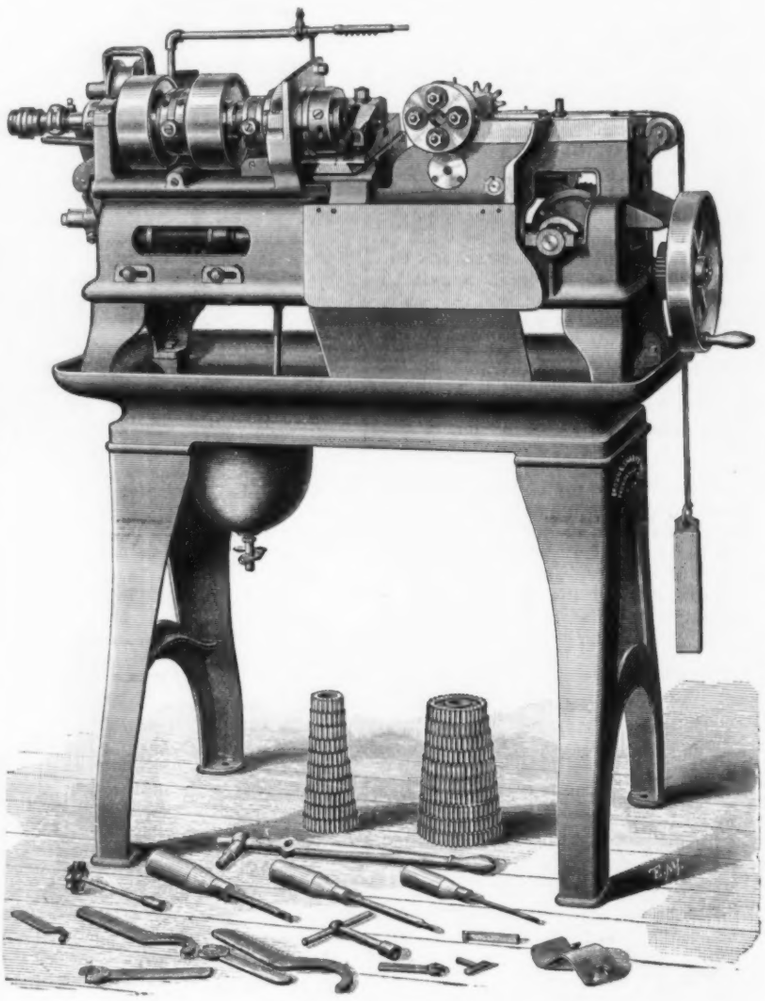
A paper published in the coal regions suggests that culm, the refuse of the mines, could be used in burning garbage, the refuse of cities.

Western Failures.

W. H. Chenoweth Company, manufacturers of architectural iron at Rockwell and Fillmore streets, Chicago, made a voluntary assignment on the 12th inst. Samuel S. Warne was appointed assignee, and the assets were scheduled at $24,000, and the liabilities placed at the same amount. The insolvents' attorney said that the failure was due to the small amount of capital and the pressure of creditors to obtain payment of notes given to erect a foundry building costing $16,000. The attorney stated that the dozen or more creditors will receive dollar for dollar.

It had been supposed that the Sioux City Engine Works would pull through their financial entanglement with the Union Loan & Trust Company, but on the 11th inst. they were further hurt by the failure of a Chicago bank, which tied up $35,000, and they were compelled to make an assignment.

On the 12th inst. F. W. Oliver of St. Louis secured a judgment in the St. Clair County Circuit Court against the Belleville Steel Company, at Belleville, Ill., of which T. A. Mysenberg of St. Louis is the president, for $2371.46, and shortly afterward he filed a bill against the company for relief, alleging the company to be insolvent. Judge B. F. Burroughs, upon hearing of the matter, appointed Chas. Becker and Bernhard Goch of Belleville as receivers for the Belleville Steel Company and fixed their bond at $100,000. During the afternoon three mortgages given by the company, aggregating $115,000, were filed, one in favor of F. W. Oliver of St. Louis for $50,000, and two in favor of the Tudor Iron Works of St. Louis for $40,000 and $25,000 respectively. The Belleville Steel Company have had two plants in operation almost steadily since their organization about three years ago—the Valley Nail Mill and the Waugh Steel Works, giving employment to about 900 workmen. It is proposed to keep the works in operation until such time as the court may order a disposition of the property.

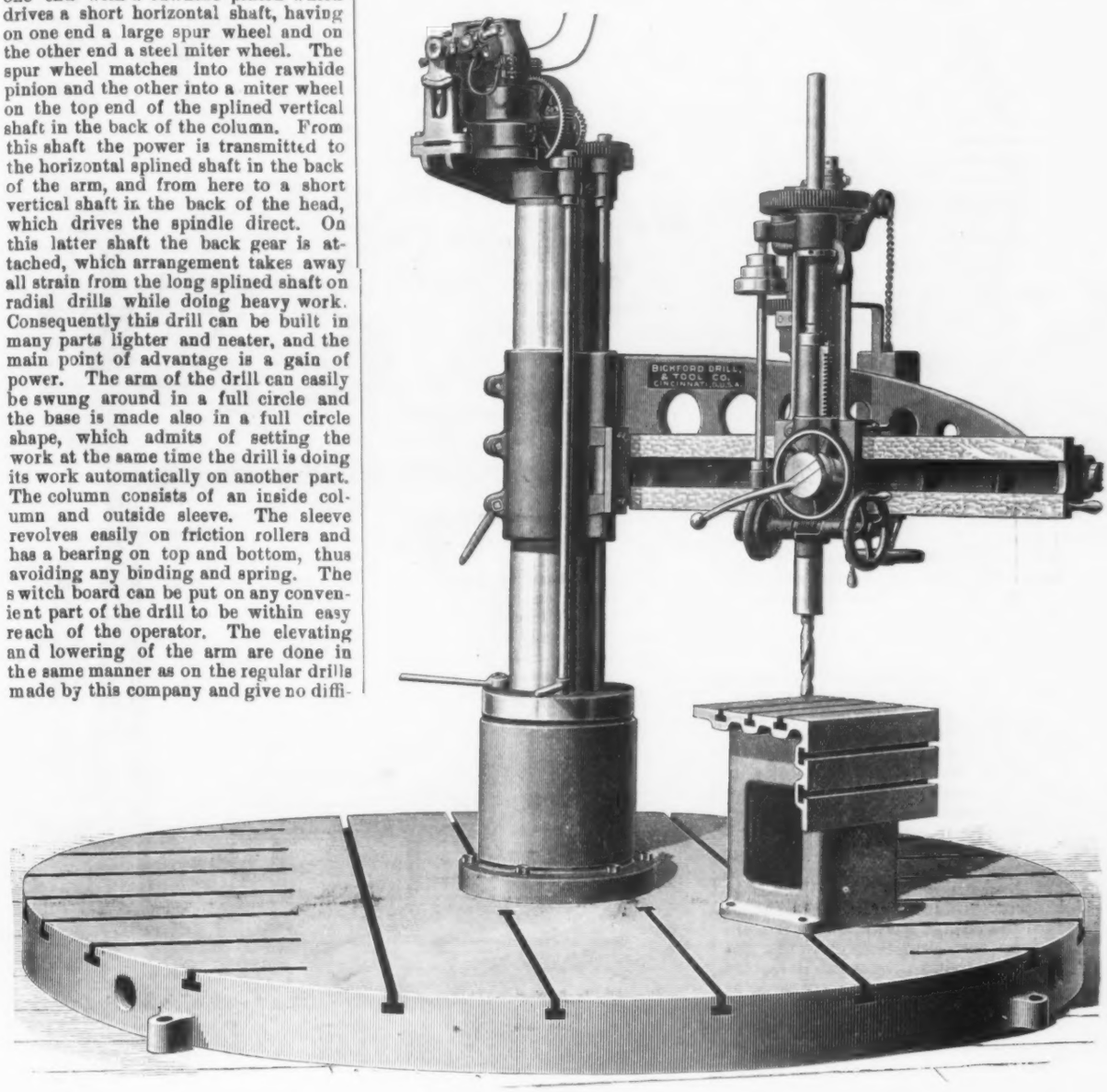


THE BROWN & SHARPE AUTOMATIC SCREW MACHINE.

The failure of the Premier Steel Company, at Indianapolis, Ind., we are informed, did not involve the Indiana Steel Company. They are distinct corporations, although managed by the same set of officers. The Indiana Steel Company receive blooms from the Premier Steel Company and manufacture them into beams and other structural shapes. It will be seen, therefore, that the Indiana Steel Company are purchasers from the Premier Steel Company. Occupying portions of the same plant, it is not singular that the two companies should be regarded by the general public as practically the same corporation, whereas a number of the stockholders in the Indiana Steel Company are not interested in the Premier Steel Company. This explanation is due in view of reports in circulation affecting the Indiana Steel Company.

Electrically-Driven Radial Drill.

The Bickford Drill & Tool Company, Cincinnati, have designed a new radial drill for the Crocker-Wheeler Electric Company of New York, who make the motor used on the machine, it being distinguished by a very large armature and low speed, which particularly qualify it as the motive power for heavy drilling machinery. The motor is fastened to the top cap of the drill column and its armature shaft is supplied on one end with a rawhide pinion which drives a short horizontal shaft, having on one end a large spur wheel and on the other end a steel miter wheel. The spur wheel matches into the rawhide pinion and the other into a miter wheel on the top end of the splined vertical shaft in the back of the column. From this shaft the power is transmitted to the horizontal splined shaft in the back of the arm, and from here to a short vertical shaft in the back of the head, which drives the spindle direct. On this latter shaft the back gear is attached, which arrangement takes away all strain from the long splined shaft on radial drills while doing heavy work. Consequently this drill can be built in many parts lighter and neater, and the main point of advantage is a gain of power. The arm of the drill can easily be swung around in a full circle and the base is made also in a full circle shape, which admits of setting the work at the same time the drill is doing its work automatically on another part. The column consists of an inside column and outside sleeve. The sleeve revolves easily on friction rollers and has a bearing on top and bottom, thus avoiding any binding and spring. The switch board can be put on any convenient part of the drill to be within easy reach of the operator. The elevating and lowering of the arm are done in the same manner as on the regular drills made by this company and give no difficulty at all to the motor. The test of this machine, made at the builders' shops, was very satisfactory, the drill proving to be perfectly accurate and to possess all the power required for work of the heaviest kind.



ELECTRICALLY DRIVEN RADIAL DRILL.

A commercial agent representing the United States Agricultural Department who has returned from a tour in Europe speaks with enthusiasm of the prospect this country has of finding a splendid market for our wine products all through Northern Europe in competition with Italy, Spain and France. This is particularly true of wine of the lower grades, which Americans can make at a comparatively moderate price. Fruits, too, will compete successfully with those of Mediterranean countries.

The Ohio Miners' Scale.

The Ohio coal operators and miners in conference at Columbus, Ohio, last week agreed on a scale on Thursday, the 11th inst., which was signed by delegates in attendance. It provides that a general committee for the State, consisting of two operators and two miners, to co-operate with and be assisted by local committees to consist of two other operators and two miners of each district, the whole to constitute a board of investigation, be appointed to inquire into the cost of production and other matters in each district as defined and specified in this agreement—viz.:

1. Cost of placing lump coal free on board cars, and the details of said cost; 2, wages paid to all classes of day labor; 3, average earning capacity of men working by the ton for the period of one year; 4, average earnings per day of the best 100 men in each field based on the number of days worked during the year, designating room men and entry men, 10 per cent. of the 100 men to be entry men and so designated, and their earnings to be separately stated; 5, average proportion of small coal made and marketed in each district.

That the period for examination and inquiry shall be the mining year from May 1, 1892, to May 1, 1893; that the committee herein provided for shall conduct its inquiry between June 1, 1893, and October 1, 1893, and at the close of the investigation shall print a full and complete report, without recommendation, of the facts obtained, of which copies shall be furnished both operators and miners of the State, the expense of said committee to be borne equally by operators and miners.

The case of Engineer Lennon of Toledo, who was arrested and fined by Judge Ricks for refusing to take out a Lake Shore train, has been advanced on the calendar so that it will come before the United States Court which convenes in October. Important principles are involved.

Self-Oiling Loose Pulley.

The accompanying cuts clearly show the construction of a self-oiling loose pulley made by the S. A. Woods Machine Company of South Boston, Mass. The pulley revolves on the sleeve A, which is shown in cross section in Fig. 2 and mounted upon the shaft in Fig. 3, which is fastened to the shaft by the set screw B. The large holes in the sleeve extend from end to end and form capacious oil spaces, from which the small radial holes conduct the oil to the bearing surfaces. When the shaft is revolving the oil is carried to the bearing by centrifugal force; when the belt is on the loose pulley and the shaft is at rest the oil flows by gravity to the bearing through the lower rows of holes. These pulleys need oiling only at intervals of from one to three months, according to the speed at which they are run and the duty performed.

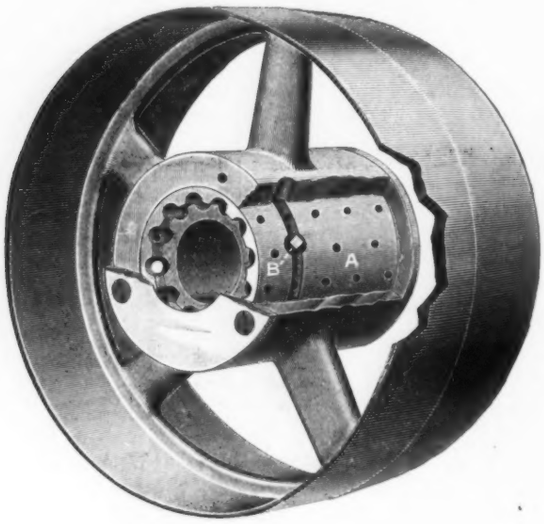


Fig. 1.

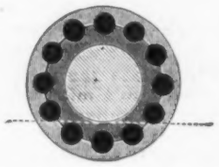


Fig. 2.—*Cross Section of Sleeve.*

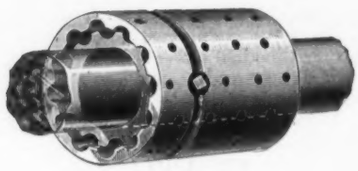


Fig. 3.—*Sleeve on Shaft.*

SELF-OILING LOOSE PULLEY.

The Betts Horizontal Boring and Drilling Machine.

The improvement in horizontal boring and drilling machine construction which we here illustrate is the invention of Alfred Betts, president of the Betts Machine Company, of Wilmington, Del. We understand that the few machines that are provided with this improvement have given very great satisfaction. In this modification the table is supported at several points, which are so arranged as to be capable of simultaneous adjustment. The work table B is guided at one end by the supporting head C, and at the opposite end by the removable steady rest D, which also forms a support for the boring bar. It is sometimes necessary in drilling large work to remove this steady rest, and the adjusting devices for effecting the vertical movement of the table must, in that event, support and guide this end of the table. To accomplish this there is a series of vertically adjustable screws, E, F and G, which are distributed in such a manner that the removal of the steady rest will not in any away affect the stability of the table B. The screws employed are three in number. The screw E is situated near the center of one end of the table, and the screws F and G are placed at points equidistant from the center and near the opposite end of the table. At the lower end of each screw is a nut, *e*, and secured to each nut is a worm wheel, *f*, the nuts and worm wheels being so arranged and supported in pockets in the base of the machine as to turn freely on the screw and adjust the table in either direction.

Extending diagonally across the base of the machine is a shaft, H, on which are secured worms *h* and *h'*, the worm *h* meshing with the worm wheel of the screw E and the worm *h'* meshing with both of the worm wheels of the screws F and G; the two latter screws being provided with threads of the same pitch but running in opposite directions, so that the rotation of the worm *h'* will effect precisely the same extent of movement of each screw and the table will be adjusted to precisely the same extent at each of its three or more supports. On the outer end of the shaft H is a bevel gear, *i*, with which engages a similar wheel, *i'*, mounted upon a shaft, I, which also carries a belt wheel, J, by means of which the necessary power may be transmitted to the shaft H to adjust the table, and a more delicate adjustment is provided for by making the outer end of the shaft I of square form, to which a wrench or key may be applied.

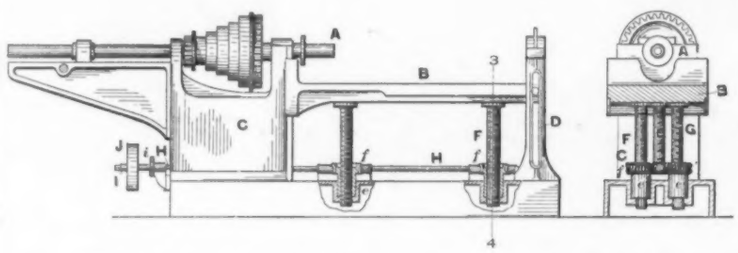


Fig. 1.—*Sectional Side Elevation.*

Fig. 2.—*Cross Section on Line* 3 4.

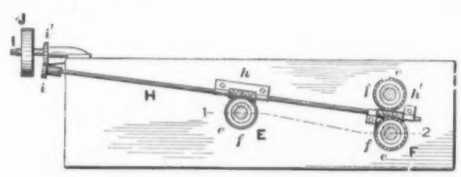


Fig. 3.—*Plan.*

THE BETTS HORIZONTAL BORING AND DRILLING MACHINE.

The great drainage system in the City of Mexico, for which $10,000,000 was borrowed in London, will be in operation in two years. Before that time expires it will be necessary to borrow $10,000,000 more.

It is reported that the German Government has refused to adopt the Dowe so called bullet-proof cloth on account of the heavy cost of the material, and the fact that with little trouble a bullet could be produced which would easily penetrate the cloth.

The Wickes Hydraulic Riveting Machine.

This machine was designed especially for use on heavy marine work that could not be handled conveniently in the ordinary stake riveter. It has been used for some time in the boiler works of the builders, Wickes Brothers of East Saginaw, Mich., and has proved satisfactory in all respects. The machine in use gives a pressure of 75 tons on the rivet with 1200 pounds at the accumulator. The frame of the machine is substantially U-shaped, as shown in Fig. 1—that is, the two arms connect at one end, one arm forming the stationary jaw, the other arm carrying a hydraulic cylinder. The movable jaw is pivoted between the two arms of the frame and is connected to the piston of the cylinder.

A is the curved suspending arm, having the bearing B at the top journaled in the eye C of the suspending link D, which is suspended from an overhead track by means of chain block, so that it may be raised or lowered. The curved arm at its lower end is provided with the circular bearing G, in which the trunnion H of the riveter is journaled, a worm gear wheel, I, being secured at the outer end of the trunnion, acting as a collar to hold the frame in position, and the worm J engages therewith, having a suitable crank handle for rotating the riveter into any desired position. The riveter frame consists of the arm *a*, which forms the stationary jaw, and the arm *b*, the two being connected by separated webs forming between them a chamber, at the rear end of which is journaled the movable jaw *d* upon the trunnion *e*. The arm *b* at its outer end is provided with the obliquely arranged cylinder *f*, in which is the piston *g*, which is pivotally connected to the movable jaw. It is evident that the riveter and its frame may be turned in a horizontal plane from the suspending link D, and that the riveter frame itself may be turned in a vertical plane upon the trunnion H. The movable jaw and the outer end of the stationary jaw project slightly beyond the arm *b* of the frame and this in connection with the oblique arrangement of the cylinder *f* gives plenty of room for handling and moving the work in front of the jaw, and yet permits applying the hydraulic piston to the movable jaw in close proximity to its outer end. The movable jaw is provided with a segmental flange guided between the guides formed at the forward end of the connecting webs.

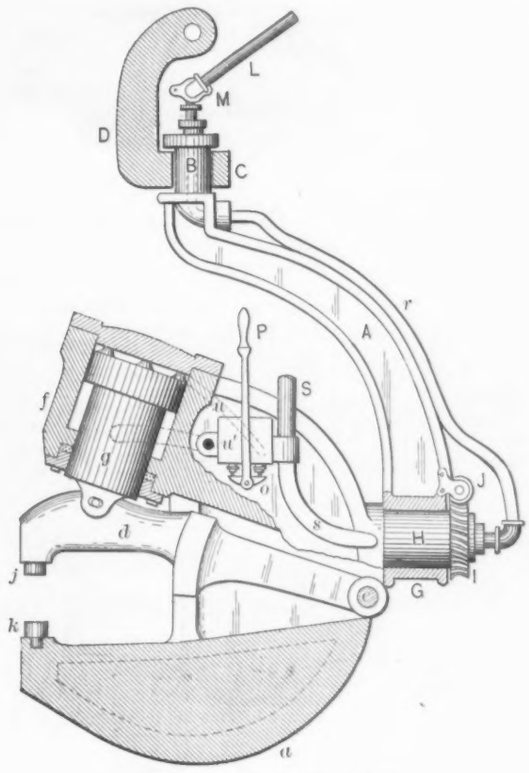


Fig. 1.—Sectional Elevation.

L is the connecting pipe between the main supply pipe and the riveter frame, this pipe being in sections connected by swiveled joints M. These swiveled joints are formed as shown in Fig. 2, the pipe being provided with a collar, *l*, and the nipple *m* beyond the collar. A recess, *n*, is formed in the elbow or connecting pipe and packing, *o*, is placed around the nipple *m*, and a suitable packing gland, *p*, recessed to receive the collar *l*, is secured into the outer end of the recess *n*. A pair of these swiveled joints arranged as shown will make a simple and universal joint. The pipes L connect with a passageway in the bearing B, which connects into a pipe, *r*, extending down beside the arm A to a point opposite the center of the trunnion H and connects with a central passage which communicates with a pipe, *s*, at the side of the frame connected into the valve chest *t*. In Fig. 4 *u* is a passageway leading from the valve chest to the top of the cylinder and *u'* is a passageway leading from the valve chest to the bottom of the cylinder. N N', Fig. 3, are two sets of valve stems, two in each set, having suitable valves to control the ports through the valve chest. O is an actuating arm on the shaft O' for actuating either set of valves. P is a lever for rocking this shaft. When the lever is turned to actuate the valve stems N', the water under pressure will pass through the connections

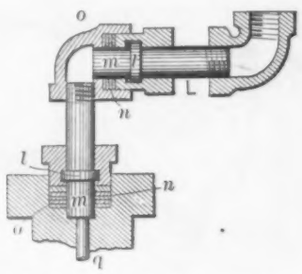


Fig. 2.—Section through One of the Swiveled Joints.

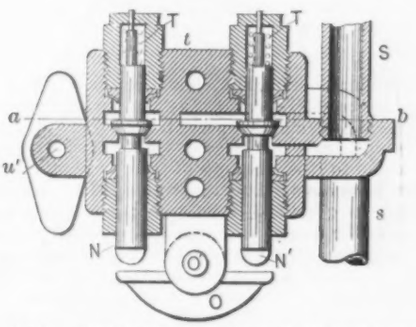


Fig. 3.—Vertical Section through Valve Chest.

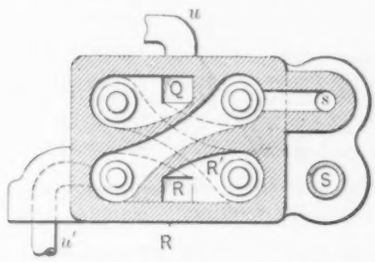


Fig. 4.—Cross Section on Line a b of Fig. 3.

THE WICKES HYDRAULIC RIVETING MACHINE.

which is suspended from an overhead track by means of chain block, so that it may be raised or lowered. The curved arm at its lower end is provided with the circular bearing G, in which the trunnion H of the riveter is journaled, a worm gear wheel, I, being secured at the outer end of the trunnion, acting as a collar to hold the frame in position, and the worm J engages therewith, having a suitable crank handle for rotating the riveter into any desired position. The riveter frame consists of the arm *a*, which forms the stationary jaw, and the arm *b*, the two being connected by separated webs forming between them a chamber, at the rear end of which is journaled the movable jaw *d* upon the trunnion *e*. The arm *b* at its outer end is provided with the obliquely arranged cylinder *f*, in which is the piston *g*, which is pivotally connected to the movable jaw. It is evident that the riveter and its frame may be turned in a horizontal plane from the suspending link D, and that the riveter frame itself may be turned in a vertical plane upon the trunnion H. The movable jaw and the outer end of the stationary jaw project slightly beyond the arm *b* of the frame and this in connection with the oblique arrangement of the cylinder *f* gives plenty of room for handling and moving the work in front of the jaw, and yet permits applying the hydraulic piston to the movable jaw in close proximity to its outer end. The movable jaw is provided with a segmental flange guided between the guides formed at the forward end of the connecting webs.

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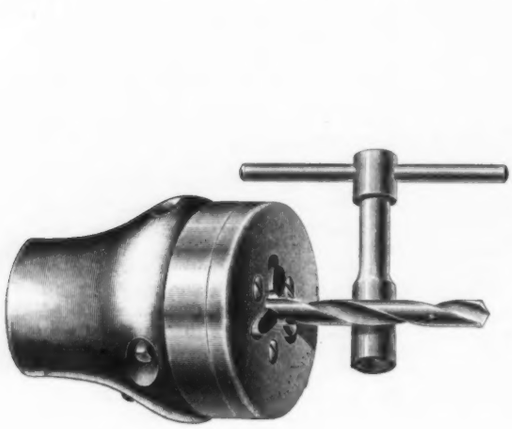
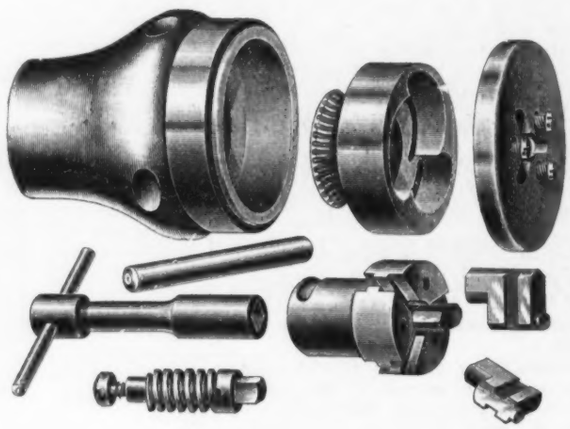
Another attempt will soon be made to erect a great iron lighthouse off Cape Hatteras. In magnitude the work will compare with the Brooklyn Bridge.

The Horton Drill Chuck.

The accompaning cuts illustrate a recently patented drill chuck which is made entirely of steel except the shell or body, which is made of special strong cast iron. The jaws are made of tempered tool steel and are ground to secure accuracy. The several parts are made to standard gauges, and are practically interchangeable. The chuck is dust proof, as the steel cap covering the face effectually protects the parts from dirt and chips, and at the same time adds materially to the strength of the shell. The jaws have a bearing on the cams $\frac{5}{16}$ inch long and $\frac{5}{16}$ inch wide; this prevents the parts from wearing fast and the jaws from tripping up at the outer end when a drill is being gripped hard, and gives a very perfect running chuck. The application of power by the worm gear to the cams, by means of which the jaws are moved to and from the center, gives the most powerful gripping action. The jaws cannot be run out of the chuck when in use, and there are no sharp angles or projections upon it. The chuck will hold drills from 0 to $\frac{1}{2}$ inch.



Chuck Assembled.



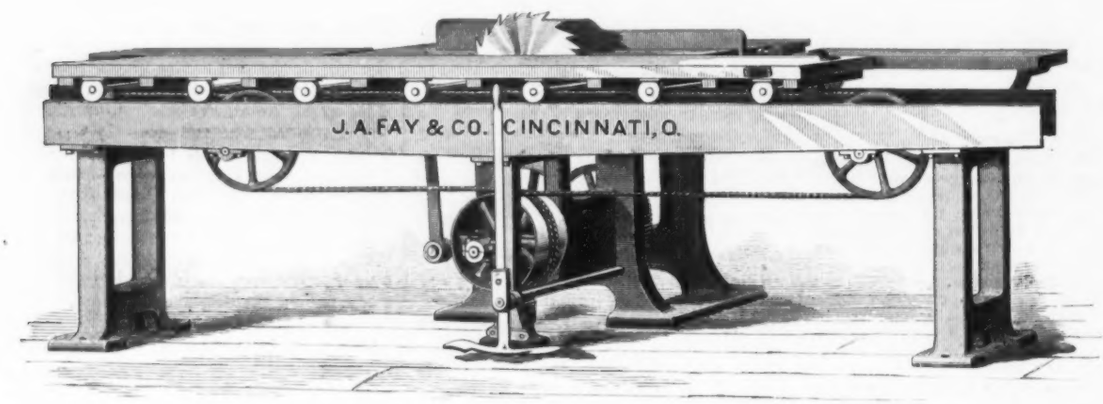
Parts Separated.

THE HORTON DRILL CHUCK.

Railways at Boston, by crossing the St. Charles and Mystic rivers on piles, have so far encroached on the channels that Boston harbor is shallowing for want of "scour" to remove deposits, whereas steel bridges of moderate span would relieve the difficulty and make the harbor navigable by large steamers.

Power-Feed Carriage Edging Machine.

This machine was designed by the builders, the J. A. Fay & Egan Company of Cincinnati, Ohio, particularly for use where lumber is to be ripped into strips having straight or parallel edges. The framing is made wholly of iron, with planed ways. The carriage is of wood and runs on friction rollers, ground to fit the ways on the frame; it has a powerful feed, at all times under perfect control. The saw arbor is of large diameter, runs in heavy connecting self-oiling bearings, and the saw end has an expanding device to suit saws of different sized holes without the necessity of bushing them. In operation the material to be edged is placed on the carriage against a stop and the starting lever moved, when the carriage, which is driven by friction, is moved past the saw, and the lumber is edged. The lever moved in the opposite direction causes the carriage and material to be returned to the starting point, ready to repeat the operation. A stationary table, with ripping frame, is attached on the right-hand side, so that when the carriage is locked special work or hand ripping can be done. These machines are made in five sizes, to rip 16, 20, 24, 32 and 50 feet long.



POWER-FEED CARRIAGE EDGING MACHINE.

A New Explosive.

Maximite, a new high explosive, the invention of Hudson Maxim of New York, was recently tested in blasting operations in this city with, it is reported, excellent effect. The substance is described as a nitro-glycerine compound, the base being gun cotton, but the ingredients and process of manufacture are a trade secret. It is almost smokeless in its operation, and is said to exert a power equal to that of pure nitro-glycerine or nitro-gelatine, weight for weight; while it can be made sufficiently cheaply to compete with dynamite. It is claimed that 10 ounces of maximite are equal in effect to 1 pound of 40 per cent. dynamite. The special features of the new explosive as set forth are that it is unfreezable; "that one cartridge cannot be exploded by the explosion of another standing beside but not touching the first; that the material is difficult to set fire to, and that it cannot be exploded by striking with a hammer, while a temperature of about 400° F. is required to explode it by direct heat." The explosive and the processes of manufacture have been patented in this country and abroad. It is handled by the Columbia Powder Mfg. Company of 280 Broadway, New York.

Newfoundland rejects the proposition to enter the Dominion of Canada.

WORLD'S FAIR NOTES.

In Favor of Sunday Opening.

Members of the Chicago World's Fair Directory passed a resolution on the 12th inst. that the World's Fair should be open Sundays on and after May 21. They took this action upon the recommendation of Director Edwin Walker, the leading legal adviser of the board After many hours of thought Mr. Walker, in consultation with Lyman J. Gage, Henry B. Stone and others, came to the conclusion that Congress had no authority over anything other than the exhibits, and that the directory was free to act in accordance with the terms of the resolution which Mr. Walker presented. His resolution does not propose to open the exhibit buildings, the great structures in which the products of all countries are housed, but merely the grounds about them—the Plaisance and the State and Foreign buildings—providing those in control of them so elect.

Inasmuch as the big exhibit buildings may not be entered by the visitors, the directory proposes that a charge of but 25 cents be made to enter the grounds Sundays. The action of the directory was taken in accordance with what is believed to be public sentiment.

Members of the National World's Fair Commission are disposed to resent the assumed right of the local board to open the gates, even if the exhibit buildings remain closed. They have declared that the directory could not, without the sanction of the commission, put such a resolution into operation, and they have previously threatened that legal proceedings would be instituted if their concurrence was not secured before Sunday opening in any form was attempted.

Foreign Exhibitors Object to Single Judges.

Commissioners representing Austria, Belgium, France, Germany, Great Britain, Italy and Russia have addressed the following protest to the National Commission against single judges:

We believe it would be far more satisfactory if the jury system which has been elaborated at the various great exhibitions of the world could be adopted, a system, that is to say, under which the awards are made by juries of moderate size, representing a certain number of groups, the decision of these juries being subject to revision by a jury of each department, and if necessary by a single superior jury, on which foreign commissions should be duly represented.

We think that the opinion of a single expert would be less satisfactory to an exhibitor than the opinion of a number of such experts acting as a jury. We think that duly qualified experts would shrink from the responsibility of making individual reports.

We believe it would be impossible to examine during the time of the exposition all the individual exhibits in the way we understand it is proposed, and we consider that proper weight should be attached to the reputation of the exhibitor, to the excellence of his manufactures, and not solely to the merit of the special articles which he may have produced solely for the purpose of exhibition.

With regard to the proposal that the awards should be of a single class, we understand that this has been definitely decided by the National Commission, and we do not propose formally to raise any objections, but we consider that the idea of graduated awards is preferable, and we would suggest that at all events some distinction may be made on the diplomas as to the degree of merit appertaining to each exhibitor's production.

We would further impress on the National Commission the necessity of definitely informing foreign commissioners of the number of judges allowed to each country, and of the classes in which they should be appointed, and the proportion which foreign judges would bear to American judges; that a definite date should be fixed on which the jurors should commence their work, and that no alteration should be made in this date; also that a definite date should be fixed on which the jury of revision should receive the reports of juries of first instance.

In making these suggestions we have endeavored to formulate what we consider to be the most moderate concessions which we believe foreign commissions have a right to demand on behalf of the interests of the countries they represent, and we feel that unless these concessions are made foreign commissioners must reserve to themselves the right of declining to take part in the work of the awards, and, if necessary, of placing the exhibits of their respective countries *hors concours* and withdrawing them from the consideration of the judges.

The difficulty about the system of making awards at the fair arises from the fact that even those who prepared the plan do not know exactly what it means. John Boyd Thacher of New York is acting chairman of the committee. Mr. Thacher wanted to ignore all precedents, do away with juries of awards, and have a single judge examine the articles offered for competition in a certain group. He worked on that scheme nearly two years. Some months ago the Board of Control took up Mr. Thacher's plan and modified it. The Board of Control recognized the one-judge system to the extent of ordering that one judge should examine the articles and write the reports, which were then to be signed by other members of the jury.

"It's the single-judge plan," Mr. Thacher gleefully exclaimed, after his long fight with the Board of Control.

"It's the old jury system, pure and simple," said members of the Board of Control, and both quit the contest feeling that a great victory had been won.

It may be that the plan indorsed by the Board of Control is none other than the old-fashioned jury system, but exhibitors did not so construe it, and complaints have been pouring in on Director-General Davis for months. Exhibitors criticised the one-judge plan no less severely than they did the long delay in naming foreign judges who were to pass upon exhibits in the international work.

The matter will again be considered by the National Commission, in view of the decided position taken by the foreign exhibitors.

Demand for Engineering Tests.

Dissatisfaction is expressed by engineers, by manufacturers of boilers, engines, motors and railway appliances and by fuel companies with the methods of making awards at the World's Fair. It is understood that no sort of test is to be made of any engine, motor or fuel or mechanical device whatever. It is greatly to be deplored, these engineers say, that the exposition authorities have seen fit to neglect such an important matter. Here, they say, is an opportunity such as never before existed for the world to acquire a fund of information valuable beyond all computation to engineers and to manufacturers. Every type of engine, steam generator, gas and other motor; all methods for the transmission of power by compressed air, electricity, wire rope; all sorts of carrying machinery and numberless other mechanical devices are here gathered together ready to have their comparative merits shown, and the opportunity is to be passed by. It is understood that no provision has been make for comprehensive scientific tests as suggested by the American Society of Mechanical Engineers. It is urged that not only practicing engineers but business men desiring to engage in some line of manufacturing could refer to the reports made and have an actual, unprejudiced account of the performance of any engine or machine in which they might be interested, instead of being forced to rely on the assertions of manufacturing agents.

This would not necessitate any competition, the engineers say. All tests of each class of exhibits could be made on the same line and the results published by the World's Fair authorities. They agree that even if Mr. Thacher would carry out his single-judge idea and provide means of making tests it would be a big thing. It would be better for all concerned, they say, to have fewer judges and spend some of the money thus saved in making the tests.

As for the manufacturers who have exhibits at Jackson Park, they seem to have taken it so entirely as a matter of course that tests were to be made that most of them expressed great surprise when it was intimated to them that such was not the case. Had they known, many of them say, that no tests were to be made they would not have spent so much money in making exhibits. Some go still further and declare they would have made no exhibits at all. In brief, it would seem that all concerned are extremely anxious that tests be made.

In December, 1892, a committee appointed for the purpose by the American Society of Mechanical Engineers, at the request of the Committee on Awards of the World's Columbian Exposition, presented a report on methods for physical and mechanical tests of steam engines and other machines. After dwelling upon the great opportunities afforded by international expositions to keep pace with the developments of other nations in the various departments of science and art and for careful tests of the relative merits of the various products, manufactures, machines and methods developed under different conditions in various parts of the world, the committee recommended a most elaborate series of tests, going into great detail for the guidance of the National Commission. Although submitted in due form and in good season, is is said, this report was practically ignored by the Committee on Awards. Its suggestions have not been acted upon. Whatever merits the exhibits of engines, boilers and motors may possess will from present indications not be disclosed at the fair. All exhibits of this class will be there exclusively on appearances.

State Commissioners Aggrieved.

States rights at the fair was discussed at a recent meeting of the Executive Committee of the National Organization of State World's Fair Officials. The Executive Committee consists of E. C. Hovey of Massachussetts, chairman; A. B. Farquhar of Pennsylvania; B. F. Havens of Indiana; Donald McNaughton of New York; J. D. Apperson of Iowa; C. P. Mattocks of Maine; J. C. Wyman of Rhode Island, and J. G. Gwynn of Missouri.

For several months the State executive officers have felt dissatisfied at the way things are running at Jackson Park. It is said that they have not been treated with dignity at the hands of the exposition authorities, and that not only has no official ceremony been used in dealing with them, but they have received no recognition upon public occasions, and beyond being held re-

sponsible for their States' exhibits being ready on time they have been left to shift for themselves.

This has gone on for some time, according to some of the commissioners, and the Executive Committee was appointed to see that hereafter the State officials received the courtesies they claim they are entitled to. One of the Executive Committee says :

"We want our position at the exposition defined. Our State governments have sent us here to represent the functions of the different States at the fair. We have been treated with scant courtesy, and have never been asked to participate in any of the public functions of the fair. Representing as we do the great commonwealths of the United States, it seems hardly right that we have never been asked to meet officially any of the representatives of foreign powers. Our position seems to be only that of overseers of exhibits. We were sent on here by our States to direct foreign attention to our different sections. As yet I have to see the opportunity that any of us has had of meeting any of the foreign commissioners other than in a purely personal matter."

Germany's Great Display.

Germany takes a position of such prominence in all departments of the fair that it almost looks like a German exposition. Germany's exhibits are the pride of all who either claim allegience to that country or are of German descent. The German Building, overlooking Lake Michigan, is the showiest of all the foreign buildings. The exhibit made in Manufactures Building is the furthest advanced of the exhibits of foreign governments in that building with the possible exception of Great Britain. In every building on the grounds the German exhibits are far along, and there are some critics who claim for many of these greater excellence than that possessed by other exhibits.

The great feature of the exhibit in Manufactures Building is the open courtyard fronting on Columbia avenue, where is to be shown the handiwork of the German gold and silver smiths and the porcelain art work, in which the artists of the German Empire excel the workmen of all other countries. There is a space of 161 feet, separated from the broad passageway by a fence of wrought iron, with three gates also in wrought iron, which combine massiveness with artistic workmanship. The fence is in itself one of the most interesting displays not only of the German exhibit, but of the entire exposition.

As a background to the gold and silver exhibit is built a portico with saracen pillars of porcelain and having for a centerpiece a huge painting on porcelain tiles, the work of Prof. A. Kips of Berlin. This is flanked on either side by an allegorical painting on porcelain, and to the north and south of this are alcove rooms, a part of the whole which ends in curved walls which in turn are joined to iron gates.

Armbruster Bros. of Frankfort-on-the-Main furnish for the exhibit the beautiful wrought-iron fence which separates this section of the exhibit from Columbia avenue. The style of the work is rococo and the central one of the three gates is said to be the largest piece of wrought-iron art work ever made. It stands 40 feet high and is 22 feet in width, and the gates alone weigh 18 tons exclusive of the elaborate posts and surmounting top piece. The side gates are 30 feet high and 15 feet wide, and each pair weighs 13 tons. The iron was hammered and wrought from crude bars entirely by hand work. The fence complete represents the work of 150 of the firm's most skilled workmen for a total period of almost six months. Fruit and flowers and delicate leaves have been hammered from the iron until they look to be the work of a skillful goldsmith, instead of the brawny wielders of sledge hammers over huge anvils. The central gate is the principal feature of this exhibit. Huge bars extend from the top to the bottom, filled in between with delicate tracery work, and the top and bottom are each marked by molding in keeping with the whole. Towering high above the top piece is a basket of flowers, hammered out of iron, and looking as life-like, save for the color, as would a basket of wax fruit or flowers. The total length of the fence is 161 feet. After its completion it was set up both in Frankfort and Berlin and the news of its excellence brought thousands to view it. The Emperor himself paid it a visit and expressed his admiration of its workmanship in unmeasured terms of praise. It is probable that the fence will remain in America at the close of the exposition.

Baden makes an exhibit at the north end of the inclosure. There are three artistic iron gates, which serve as a background, the central one of which stands 20 feet high and has beneath its ornamental top piece the word "Baden," wrought in iron. The work of the jewelers of Baden will be shown in cases directly in front of this. These gates are the work of Bieler of Offenburg, Baden. The Bavarian countries have contributed three more ornamental wrought-iron gates for the south end of the inclosure.

Passing around the north end of this block and walking south one comes to some exhibits of wonderful interest and beauty. The first is a collection of old-fashioned German wood stoves. This strange article is made of earthenware or porcelain, as the case may be. Each stove is 10 or 15 feet high, with folding doors to the grate, and decorated in the highest style of art. One can only compare it to a church altar in pottery or porcelain. The style of the room is rococo and renaissance. Next comes an extensive exhibit of cooking ranges by H. Koloseus of Aschaffenburg. They are 6 x 13 feet in size, faced all around with beautiful tiling and mounted with polished steel and brass.

The third block of the German exhibit contains more splendid exhibits than both of the others put together. The first of these exhibits is that of the great cutler, J. A. Henckel, at Solingen. Forty feet of upright showcases, with plate-glass doors, are filled with his table, pocket and surgical cutlery. Lying down in the front of this showcase is a magnificent pair of lady's scissors. The blades reflect everything about them like mirrors, and the handles appear to be of gold exquisitely chased. Crowds of ladies bend over them, and gaze wistfully at them; and yet they will probably never find a purchaser, as they are 6 feet long and weigh 200 pounds. Other familiar articles of cutlery in the same neighborhood are on the same Brobdingnaggian scale. There are carving knives and forks, of perfect finish in every way, that are 4 feet long, and that would be a good load for a man; and numerous butchers' knives and kitchen knives are just as large. But all of them are as elegant in every respect as those of smaller size.

The next exhibit is equally interesting for its intrinsic merit and on account of the exhibiter, Prince Stolberg, who is one of the hunting associates and boon companions of the German Emperor. The exhibit consists of decorative iron work from the Prince's immense works at Ilsenburg, in the Hartz Mountains. The articles are antique shields, breast plates, helmets, swords, battle axes and spears, and then a line of more peaceable articles, such as tables, screens and cigar presses.

The next attraction is a needle exhibit by Funker Bros. of Siechen, mainly noticeable for a large picture of a steamer on a rough sea, all done in needles, which are skillfully made to resemble the sheen of the water. There is a rare exhibit of hammered copper goods by Peter Seitz of Munich, consisting of vases, chandeliers, lanterns, crucifixes, champagne coolers, and what not Immense vases, 4 feet high and 3 feet wide, graceful in shape and elaborately chased and decorated, are shown, which have been hammered out of a single piece of copper at a cost of $500. The next exhibit is that of the Geggenau Iron Works, the specialty of which is a patent process for a permanent and artistic enameling of iron. The articles exhibited include vases, console tables, card tables, decorative shields, flower stands, alcohol lamps, match safes, inkstands and a whole line of kitchen and dining-room ware. These articles are made of iron, and exquisitely painted so as to resemble the finest earthenware. So handsome are some of the designs, and so elegant the workmanship, that one forgets that it is ironware. At the immense works of the company, of which a large painting is displayed, 1200 workmen are employed, while the work is protected by at least 100 patents.

The last booth on the east side of the block is that of Armbruster Bros. of Frankfort-on-the-Main, the manufacturers of the great triple gates of the German exhibit on Columbia avenue. In the Armbruster booth one will see smaller articles which display even greater skill. These articles are candelabra, chandeliers, candlesticks, andirons, shields, railings, door trimmings, flower stands, signs, German crests, screens, brackets, picture frames, jewelry boxes, yes, and vines and flowers, all hammered by hand out of iron.

In all exhibits are made by more than 3000 German firms and individuals. These include the exhibits in the various buildings, but the greater part of the number are to be found in the German exhibit in Manufactures Building.

The Belgian Exhibit.

The little kingdom of Belgium has a very fine exhibit in Manufactures Building, conspicuous for daintiness of design and fine workmanship. In a few lines something really ambitious has been attempted, as for instance in plate glass A plate 18 x 12 feet is shown, which is an inch thick, without a flaw, and so clear that it is almost invisible. In hammered iron work the Belgians have not exerted themselves to make anything ponderous, but they have produced a few specimens of small size that are unequaled for intricacy and delicacy. One reproduces the branch of a tree, with flowers, birds and leaves complete in the smallest detail.

American Exhibits.

While there is a very great deal to be seen in every department, and visitors can now feel repaid for taking the trouble to make a trip to the fair, there

is hardly a section in which belated exhibitors are not seen hard at work completing their booths or installing their goods. So incomplete are the various departments that it seems invidious to enter upon the work of describing what has been done and necessarily omitting exhibits which will in a short time be fully as attractive as any. Another week or two will, however, make a great difference in most of the buildings.

American Tin-Plate Exhibit.

For a time the outlook for an exhibit of American tin plate was decidedly dubious. This would have been a serious omission, reflecting severely on American tin-plate makers. Through the energy of H. T. Duff of Wallace, Banfield & Co., Irondale, Ohio, the gap is being filled. A large portion of the south gallery of the Mines and Mining Building was secured, and workmen are now busy in the erection of an ornamental pavilion to be constructed wholly of American tin plate. In it will be shown specimens of the metal in its various stages, beginning with the crude materials and crowning the whole with the best specimens of the American tin-plate maker's art. The exhibit will be known as that of the Associated Tin Plate Manufacturers of the United States.

Singer, Nimick & Co.'s Unique Exhibit.

A novel feature will be introduced in the exhibit of Singer, Nimick & Co. of Pittsburgh, in the Mines and Mining Building. While they will show numerous samples of their tool steel, circular saw blanks, plow and cultivator steel, spring steel, &c., all arranged most tastefully, they have added to these an exhibit of a very wide range of finished products made from their steel, contributed by their customers. These are displayed in glass cases, and comprise such articles as bicycle drop forgings, sewing machine parts, watch springs, mechanics' fine tools, files, deep drawn cups and sockets for various purposes, table ware in its various stages from the crude steel to the silver-plated product, &c. This exhibit is intended to show the requirements which must be met by steel makers in the production of steel for a great variety of special purposes.

In the Electrical Building.

The Western Electric Company of Chicago are preparing an exhibit which aims to reproduce the very lightning of the heavens. A row of incandescent lights has been attached to a zigzag frame work about 60 feet in length, suspended from the ceiling, and through this will be sent intermittently a current of electricity. At the end it will be absorbed by a ball of incandescent lights with colored bulbs, the effect being that of a ball of fire dropping from an electric flash. There are four of these lightning lines of light radiating from a common center, the top of a 40-foot pillar. Around this pillar, 2 feet in diameter, are twined strings of incandescent bulbs of red, white and blue, 2000 in number. The pillar itself will be coated with bits of broken glass, so that light will be reflected in dazzling brilliancy in every direction. These lights will not all be kept burning at the same time. By an ingenious mechanism the current is made to pass from one row to another, beginning at the base of the column, and the effect will be a creeping upward of the three colors in succession until they reach the top, when they will shoot out along the zigzag lines like a lightning flash, to be absorbed by the balls at the ends. These balls will have the three national colors, but there will be a magical intermingling of light, as they will continually revolve at the rate of 60 to 80 revolutions a minute.

The same company have reproduced for their pavilion an ancient Egyptian temple, the ceilings of which are covered with multi-colored glass, representing jewels, above which will be placed moving electric lights, the effect being a constant succession of colors of great brilliancy. The pillars of the temple are made of glass and within the hollow center will again be placed electric lights, producing the same effect. The Egyptian eagle above the open doors, which in daylight looks like a surface picture, is also of glass, behind which there will be kept burning electric lights. The company's sign is also of glass, but so constructed that, with moving lights behind it, it will seem to flash forth the light of the diamond, sapphire and other precious stones.

Department of Machinery.

Workmen are still in possession of Machinery Hall, and represent almost as large a number as the visitors who are roaming around the huge building, watching the work and inspecting such of the exhibits as are completed. Few persons can have an adequate conception of the difficulties experienced by the management in the performance of such work as requires the employment of skilled labor. The exceptionally large force required renders the proportion of really competent workmen so small as to constitute them the exception rather than the rule, notwithstanding that every effort is made to secure all who are available. As a natural result of this condition of affairs, not only does the work progress slowly, but through the ignorance and carelessness of the incompetent element, much of it is found upon completion to be so imperfect as to require more time to correct the faults than should have been necessary for the entire work under ordinary circumstances. Outside of the work pertaining strictly to the installation of exhibits—which is, of course, done by the exhibitors themselves, and for which they are solely responsible—the various features of the general equipment of the buildings are progressing rapidly toward completion. There are now but few instances, if any, in which delay to exhibitors is occasioned from want of necessary connections with steam, water, compressed air, or oil, service pipes; and the distribution systems for electric currents, for lighting and power transmission, are being completed as rapidly as the installation of the exhibited generators and their motive power will allow. The capacity of the steam, water and fuel-oil supply is far in excess of the present requirements, and all work pertaining thereto will be completed long in advance of the exhibits dependent upon it. While up to the present time the responsibility for delay has, undoubtedly, been divided between the exposition management and the exhibitors, it may now fairly be said to devolve almost entirely upon the tardy ones of the latter class; and to their efforts we must now look for the completion of one of the most important of the many departments of this great exposition. With reference to the power plant, the progress has not been as rapid during the past two weeks as might have been fairly expected. Though, in some few instances, the work has been completed upon both engines and the dynamos and generators which they are to drive, their operation is delayed for want of the belting. As many of these latter are of 72 inches width, the work of putting on and splicing requires considerable time. None of the large engines are in operation except for one hour or so occasionally, though several are entirely ready for continuous service.

The Allis quadruple expansion is waiting for the 72 inch belt which will connect it with the second of the Westinghouse dynamos. The Fraser & Chalmers and the Buckeye 1000 horsepower triple expansion engines, for similar duty, are waiting for the same reason, as is also the Atlas 1000 horsepower twin tandem compound. Most of the isolated engines scattered throughout the main building and annex are in operation, driving the line shafting. The paper mill of the paper trade exhibit has made wonderfully rapid progress, though judging from its magnitude and the amount of work still to be done, it will require several weeks before it can be ready for operation. Outside of the power plant, nearly all of the completed exhibits are confined to the annex, although there are a few notable exceptions in the main building. The hydraulic basin still presents the appearance of a depressed roller-skating rink—the water not yet having been admitted—though this is due to the fact that the pumping machinery to be supplied by it is composed of numerous exhibits, but few of which are completed. Of machinery in operation the most conspicuous is that of the textile class, there being a large number of looms busily engaged in weaving fabrics containing various souvenir patterns—the latter, of course, being offered for sale, and finding ready purchasers in such visitors as will have but limited opportunity for visiting the fair. A few of the stamping press exhibits have machines running on souvenirs, consisting mostly of hardwood medallions embossed in some memorial design. The classes of wood-working machinery and machine tools are well represented by completed exhibits, so far as the actual placing of machines and clearing up of spaces may be so considered, though but few are yet in operation. Notwithstanding the fact that the limit of the time in which delayed exhibits were to have been admitted to the buildings, there is still a very large amount of unoccupied space. Also, there are many spaces in which the material still remains untouched in the packing cases, apparently totally neglected. Throughout the entire building the floor is more or less obstructed by scaffolding and material for the construction of platforms and pavilions, arrangement of exhibits, and miscellaneous rubbish from empty packing cases, &c. While to those who will have the opportunity of frequent visits there is sufficient to occupy a full day's attention, and they may see it later in its entirety; for such as desire to see it only as a completed exhibition it will be well to defer their visits for the present.

The Colorado River Irrigation Company have just been incorporated under the laws of Colorado, with an authorized capital of $7,500,000. Several New York and Western capitalists are interested. The plan is to excavate a canal 150 feet wide and 10 deep, and the tract to be irrigated comprises 3,000,000 acres, of which one-third are in lower California.

THE WEEK.

A new railway line across Newfoundland will traverse the extensive coal fields lately discovered.

The startling novelty of a surplus in the Spanish national budget, if followed by an improvement of roads in the interior, might signalize the beginning of national rejuvenation and development.

South Dakota's maximum freight rate law will not be enforced.

The bold undertaking of building the Canadian Pacific Railway across the continent and for the most part through a wilderness seems to have been fully justified by the results. The report of the operations of last year indicates that the work is intimately related to the material development of the country. The gross earnings amounted to $21,409,351, the working expenses to $12,989,004, and after deducting fixed charges there remained a surplus of $3,521,932. Six years before, namely in 1886, the gross earnings scarcely exceeded $10,000,000, and even four years ago they were not much more than $13,000,000, so that the rate of progression has been both rapid and continuous. In the intervening period new avenues of traffic have been opened, settlement has proceeded in the Northwest, connections have been formed with other lines, and material resources have been developed. The steamship line to Japan and China is said to justify expectations.

Coffee planting is the one booming industry in Mexico and tobacco culture is also receiving much attention from investors.

Persons who solicit laborers in North Carolina to leave the State are subject to heavy penalties.

Philadelphia papers are enraged with the State Legislature on account of the defeat of their rapid transit scheme.

The projected steamship line from Tacoma to Honolulu will commence running in a few weeks.

Prime, the Western crop reporter, who has been making close observations, confirms previous reports that farmers in that section are generally prospering; that they never before had so much ready money and are in a condition to hold their grain for better prices. They have become lenders of money instead of borrowers.

Negotiations for a revision of the Japanese treaty with foreign powers are about to be resumed, England having made important concessions, and it behooves the United States Minister to be on the alert, lest Europeans gain undue advantage, as the "most favored nation" clause cannot be relied upon as giving adequate security.

The British war ships left New York "laden with good wishes," which do not appear in the Custom House list of exports. And another peculiarity is that just as many were left ashore.

The revolutionists in Honduras are subdued, but Nicaragua is so much disturbed that an American war vessel may be necessary to protect American interests. The trouble in Southern Brazil is almost chronic. Peru and other parts of South America are uneasy.

An investigation into the management of the New York Custom House, more particularly with reference to the appraiser's office, may result in interesting developments. One report is that there is some sort of collusion between subordinate officials and importers to secure undervaluation. Ex-Collector Magone and other experts are expected to make thorough work, and numerous changes in the *personnel* of the Custom House are not improbable.

It is reported that a contract will shortly be placed for the construction of an overhead electric railway in Naples, Italy. The railway is to connect the central or business portion of the city with the Corso Vittorio Emmanuele and the residential quarter.

The depression in freights to South America is illustrated by the fact that rates for lumber from ports in Maine to Buenos Ayres are scarcely one-half of what they were a few years ago.

The United States Treasury Department will soon be called upon to decide whether natural gas imported from Canada through pipes under Niagara River is a mineral production, and how it should be classified under the tariff.

An organization is forming to carry into execution Austin Corbin's plan for a railroad tunnel to connect Jersey City, New York and Brooklyn by penetrating the bed of the two intervening rivers.

There are indications in the Eastern trade that hereafter a larger proportion of the coastwise business will be done by towing barges from ports north of Hatteras to ports in New England.

Spreckels declares that the annexation of Hawaii to the United States would ruin the sugar industry on those islands; that labor competent to do plantation work could not be obtained at wages yielding a profit. The contract system under which laborers are obtained would be broken up.

The Philadelphia Board of Health has issued a bulletin reminding citizens of the necessity for cleanliness in every respect, that garbage collections be avoided; also filth of every description; that drainage be kept free from obstruction and whitewash freely used. Offenses against the law governing these matters will be promptly punished. Pestilence comes only by invitation.

A more fitting memorial of Victoria's reign than the British Imperial Institute could scarcely have been designed. Within its walls will eventually be collected every natural product of the vast British Empire, with ample illustrations of the adaptation of these products to the arts of peace and the requirements of trade.

Prof. A. D. Hopkins has been inquiring into the cause of the destruction of pine forests in West Virginia. The Professor has run down the miscreant who kills the trees. It is found to be a small insect, which burrows in the bark. Further investigations have discovered, in the Black Forest of Germany, another small and prolific insect which feeds upon the injurious ones. Several thousand of these cannibals have been imported and distributed, and Prof. Hopkins will watch their operations this summer. They are said not to be injurious to timber.

One of the builders of the "Campania" intimates that there will be no haste in building more vessels of that type, as they are liable to go out of style.

The new shipping law which passed Congress at the close of the last session with little discussion and almost unnoticed by those whose interests are chiefly affected, introduces radical changes in the relations between shippers and carriers, to take effect July 1 next. The act is entitled "An act relating to navigation of vessels, bills of lading and to certain obligations, duties and rights in connection with the carriage of property." An attorney who has carefully investigated the subject says: "The substance of this law is that whereas heretofore the shipper of a cargo bore the risks of loss from perils of the seas, while the ship and her owner bore the risks of negligence in the stowage or handling of the cargo or in the navigation or management of the vessel until the cargo was delivered, it will be claimed after July 1 next that all these risks (the risk of negligence in the stowage or handling of the cargo possibly excepted) must be borne by the owner of the cargo. The effect of this legislation will be to produce an entire change in the business of common carriers by water. Heretofore, if the cargo owner wished to preserve himself from loss, he insured his goods against perils of the sea, relying upon the ship and her owner to protect him from other losses. Hereafter he must also insure them against the negligence or wrong dealing of the servants of the carrier."

B. E. Fernow, chief of the forestry division of the Agricultural Department, has written an interesting letter to Secretary Morton on the subject of forest growth and timber consumption, in which he takes direct issue with Henry C. Gannett, the chief geographer of the Geological Survey, who in a recent article said that the timber growth in the United States is renewing itself much faster than it is being consumed. Mr. Fernow argues to show that, on the contrary, the present rate or consumption is 50 per cent. in excess of the rate of production.

The Locomotive Engineers, in session at Schenectady, passed resolutions indorsing Chief Arthur in his action respecting the Ann Arbor strike, which brought out an injunction from the United States Court to restrain.

Word comes from a resident of 22 years in China, and who has good sources of information, that the enforcement of the American Exclusion act will be followed by reprisals, and that a speedy exodus of American subjects in that country may be expected. By such a turn in affairs the good results of the Burlingame Treaty and the friendly overtures of General Grant will be practically nullified.

Some time since the Department of Public Works asked for bids for an engine for the new high pressure pumping station to be built at 181st street and the Harlem River, New York. Six bids were received, the aggregate sums for furnishing the engines, pumps and other appurtenances ranging from $180,000 to more than $300,000. In each case the bidder was desirous of contracting for machinery exclusively of his own design. It was decided, therefore, to reject all bids received, and to prepare plans and designs for the engine wanted and readvertise for bids. The total estimated cost of the new pumping station and engine is $850,000.

A telegram from Cape Town announces that the mining engineers of the Southwest Africa Company have reported the discovery in the company's territory of extensive deposits of copper ore a few miles north of the Otavi mines in Damara'and.

The Iron Age

New York, Thursday, May 18, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Quality of Steel Plates.

If charges now in circulation are correct, consumers of steel plates need to be on their guard to see that they get precisely what they have ordered. We are informed on high authority that some plate manufacturers of hitherto good reputation are not scrupulously observing the long-established distinction between tank, shell and flange plates. In other words, contracts are taken at very low prices for high-grade plates which are filled with steel of inferior quality. This is a grave charge to make, but it is backed up by some very positive evidence and appears to be true. The makers of the steel are subject to no supervision or inspection, and take a long chance on their detection, knowing that consumers of plates are not to any extent supplied with facilities for making either chemical or physical tests. It occasionally happens that a plate fails under treatment in the boiler maker's hands, but a very plausible explanation is then forthcoming and the defective plate is replaced. If the subsequent history of some of these plates could be traced, when they get in active service, there would probably be some interesting developments. It is then that the real mischief is done by the substitution of inferior plates.

Those in the trade say that to such an extent has this practice been carried that there is to-day no protection for the consumer except the conscience of the manufacturer. It is, of course, not safe to assume that a very low price is always an evidence of inferior quality. Circumstances may arise that will compel a manufacturer to accept an abnormally low price on a portion of his output in a period of slack trade. The presumption, however, is pretty safe that when a manufacturer is willing to take a contract for shell steel at about the market price for tank steel, or a contract for fire-box steel at the current rate for shell steel, he will endeavor in some way to make himself whole. To do this he must use cheaper material, and cheap stock means deterioration in the product.

The boiler maker is placed in a very uncomfortable position as a result of such practices. If his profits were large he could discriminate in favor of high-priced plates and pay for patronizing a plate maker with a conscience. But competition for business is as keen among boiler makers as any other class of tradesmen, and profits are pared so close that they must buy at the lowest prices ruling or lose orders. They may suspect the quality of the very cheapest plates, but nevertheless are obliged to rely on the word of the manufacturer that they are what they profess to be. No reputable boiler maker would knowingly permit an unsafe boiler to go out of his shops, and there are boiler makers who will shut down rather than use plates of which they have any suspicion whatever. Unfortunately, the trade is not wholly confined to such conscientious individuals, and the inference cannot be avoided that the proportion of inferior boiler work is increasing with the persistent depression in the iron and steel trades and the remorseless grinding down of prices.

There is a possibility that methods of manufacture have so improved that the so-called inferior material is of considerably better quality than was formerly the case, and therefore consumers are not so badly treated. This view of the question would to some extent relieve manufacturers from the charge of furnishing absolutely unsafe boiler plate, but it does not relieve them from the charge that they are not delivering the plates that consumers expected to get under the terms of their contract. A serious risk may be run, which should not be taken by the steel manufacturer nor forced on the boiler maker. There seems to be no remedy for this state of affairs except an aroused public opinion which will awaken such manufacturers to a realizing sense of their responsibility to their fellow-men.

Mercantile Credits.

It cannot be denied that business men are now passing through a crucial period. While the entire situation may in truth be pronounced tranquil, there is evident disturbance and some degree of apprehension. This appears from the frequency of failures among those who are dependent on credit and bank accommodation. Naturally institutions "banking on wind" are among the first to go, sharing the fate of that class of stocks which have been watered to an extreme, and of those speculators and business men whose operations have been unduly extended, because of their inability to borrow money any longer on doubtful collateral. So long as confidence remained they could go on, but when for any reason distrust is excited more margin is called for and then their collaterals are thrown out altogether. Thus, we notice at the present time that there is no lack of loanable funds at a fair rate of interest where the security is undoubted, but collaterals are scrutinized and the financial standing of individuals and firms is the subject of inquiry. Those who rely on note brokers for accommodation are especially exposed.

This undesirable condition was brought about primarily, it will be remembered, by distrust respecting the ability of the general Government to maintain specie payments in the face of an extraordinary foreign demand for gold and declining receipts. The Sherman Silver law was recognized as the chief impediment in attempting to uphold the standard of value. Then followed the collapse of industrial stocks and the enforced assignment of prominent individuals or firms who were in some way involved as borrowers. We have later, in quick succession, the failures of "strings of weak banks," mostly in Illinois and Indiana, which have been doing business on corrupt principles, and which Senator Sherman hastens to say, contrary to report, he unhesitatingly condemned.

Among New York bankers the troubles here referred to are viewed with unconcern, as they cannot in any proper sense be taken as an index of general business. Banks in the association are in excellent condition, as shown by the last weekly statement. There was a further contraction in loans, equal to $5,000,000, and the result of all the changes was a gain of about the same amount in reserve, which now stands at nearly $18,000,000 in excess of legal requirements, against less than $16,000,000 in the corresponding week a year ago. The contraction here observed does not, a bank official explains, signify a contraction of credits, but is the result of liquidation mainly connected with stock operations. Money, as before remarked, is in good supply. Another good feature is the improved condition of the Government Treasury, there having been last week a gain in the gold balance of upward of $2,000,000. The Treasury situation excites no further apprehension.

The latest cause of concern is the sweeping disaster that has overtaken banks in Australia, wiping out large amounts of British capital and increasing the demand for gold.

Cheap Iron Production.

The establishment of prices for Lake Superior iron ore for the season at a low level is a matter of far-reaching importance. It may be stated in a general way that in 1892 there was produced from Lake ore not less than 4,600,000 tons out of a total production of over 6,800,000 tons of coke pig iron. But it is not alone to the purchasers of the raw material itself, or to the buyer of the whole range of manufactured iron and steel, that there is much of interest in the prospect of cheap metal as the result of low cost of raw material. The manufacturers in other sections of the country who draw upon other sources will do well to consider that their most formidable competitors will this year command exceptional advantages.

It may be stated in a general way that the profits in the raising and in the transportation of raw materials are down to very close figures. The only exception is coke. But even in this product a very unfair impression is created in the minds of many through the retention of the ridiculous nominal quotation of $1.90 at oven in the Connellsville district when the actual price is $1.60 and that is sometimes shaded.

So far as ore is concerned, it is not likely that costs can be much lowered. There has been some talk of reducing royalties and of lowering the rate of freight from the mines to the shipping ports, which might afford the producers some relief.

Reviewing the situation generally, the statement is warranted that in the dominating districts which use Lake Superior ores costs are as low as they ever have been, with little prospect of effecting a further saving. On the basis of the present elements of cost, Bessemer pig can be produced in the valleys, in Pittsburgh and in the Wheeling district, leaving a fair manufacturers' profit and making an allowance of $1 per ton for supplies and repairs, at $12.50 to $12.75, while foundry and mill irons, using all ore, can be produced at $11.25 to $11.75. Lower figures could be reached only by the abandonment of profit, or by exceptionally well equipped, well managed plants.

It is this level which competing districts must be prepared to come down to with some profit to themselves, unless they are content to continue a precarious existence on the chance that the works of the central West will not find it expedient to market product at cost.

It is not an encouraging sign for the near future that there is a possibility of lower prices than are now prevailing should those producers who use the raw materials under consideration go down to the lowest notch which they are in a position to reach. But it is best that the hard facts be faced squarely and honestly. Those who cannot live at present prices would do far better to close down and await better times. There is little prospect of an early recovery of the market, except possibly in some lines, should there be any prolonged stoppage of work in the Western rolling mills.

Live and Dead Productive Capacity.

The productive capacity of iron and steel works is regarded by many as far in excess of current or prospective requirements, and the figures usually presented seem to strongly confirm that view. Mr. Swank, in his summary accompanying his annual statistical volume, says:

> We believe, however, that while general causes affecting all our industries and even the world's industries, the Baring failure included, have had their influence in depressing iron and steel prices in this country, the principal cause of this depression is to be found in our capacity to produce much more iron and steel than the country could consume, notwithstanding the enormous consumption of the last few years.
>
> Pig iron furnishes a good illustration of the correctness of this view. The annual capacity of all the blast furnaces in the United States in November, 1889, was 11,757,351 gross tons, and in January, 1892, it was 14,550,708 gross tons, an increase of 2,793,357 gross tons in about two years; yet in 1890 we produced more pig iron than in 1892 and consumed almost as much, allowance being made in each year for unsold stocks and for pig iron imported. As prices of pig iron have steadily declined from 1890 to the present time, and as stocks of unsold pig iron have not greatly varied in the intervening period, the great increase in furnace capacity above mentioned may justly be held to be primarily responsible for the steady decline in pig-iron prices. Consumers of pig iron knew that there could be no scarcity in the supply of this product, and hence they were never eager buyers and bought only as their wants required; while producers, knowing that the supply was constantly in excess of the demand, were always urgent sellers and thus were themselves instrumental in depressing prices from month to month. Our capacity to produce all forms of rolled iron and steel, wire, wire nails, and many other iron and steel specialties has also greatly increased from 1890 to 1893, and the steady pressure of these products upon the market, the supply being greater than the demand, has been a constant factor in depressing prices.

While the existence of surplus capacity does have the general effect attributed to it by Mr. Swank, we believe that the impression created is not quite correct. The fact is that a notable number of the plants which figure in the aggregate of capacity might as well be in Timbuctoo, so far as their influence upon the markets is concerned. Every new works which goes up, every important alteration or addition to other more modern plants, which adds to the live capacity, consigns the old fossil establishments further back in the ranks.

In dealing with the productive capacity the price should be coupled with it. If it were possible capacity should be accordingly classified. For instance, taking the blast furnace industry by way of illustration, our capacity is, say, 9,000,000 tons, at the equivalent of $14 at the leading markets for No. 1 foundry iron, 2,000,000 tons more at $15, 2,000,000 tons more at $16 and 2,000,000 more at $17 to $20. Now, so long as the price keeps down to $14 the active capacity is 9,000,000 tons, and only that which may come into play at $15 can be regarded as having any influence whatever on prices. The other 4,000,000 tons available between $16 and $20, assumed in our arbitrary example, has nothing whatever to do with the market.

If we knew at what cost the different producers could lay down their product in the markets we could actually make such a classification of capacity. In some branches of industry it is possible to come pretty near to it. Thus in the copper trade it may be said that at 9 cents per pound for ingot in New York such mines can live, the supply at that figure being so many pounds, at 10 cents such companies can enter the ranks, &c.

If there are three rail mills who, together, can make 1,500,000 tons of steel rails at $25, two more with 500,000 tons capacity which can make fair profits at $26, and two plants, with a capacity of 500,000 tons per annum which must secure $28 to make a profit, then a $25.50 market will bring out a supply of only 1,500,000 tons. The two $28 mills are for the time being dead capacity which no seller will fear, and which will bring no comfort to a buyer.

We believe that it has been one of the great achievements of American iron manufacturers during the past few years that so many of them have worked themselves into what may be classed as the live capacity and have remained there. The struggle has been a tremendous one, in which, unfortunately, the rapid reduction in costs has been coupled with a tremendous shrinkage in profits.

According to statistics collected by the *Iron Trade Review* the stocks of iron ore at Lake Erie ports on May 1, while larger than those at the previous opening of navigation, were very considerably smaller than two years before. The figures are as follows:

	Gross tons.
May 1, 1893	2,095,797
May 1, 1892	1,537,188
May 1, 1891	2,662,223

In view of the unprecedented stocks held at Lake Erie ports at the close of navigation last fall, amounting to 4,149,451 tons, or 250,000 tons more than in any previous year, this is not a bad showing by any means. If the iron and steel trades were reasonably active these statistics would form the basis of quite a hopeful disquisition on the outlook for iron ore. But, alas! it seems useless to draw conclusions from either iron ore or pig iron statistics under present trade conditions.

OBITUARY.

HENRY BURKHARDT.

Henry Burkhardt, Western manager of the Eureka Cast Steel Company of Chester, Pa., died at Chicago on the 4th inst., of an attack of pneumonia.

GEORGE B. EWING.

George B. Ewing, who recently went to Chicago to take charge of the World's Fair exhibit of the Ashcroft Mfg. Company of New York City, was killed by an Illinois Central passenger train at Fiftieth street on the 8th inst. Mr. Ewing was sitting on the coping at the side of the subway steps, which lead to the elevated tracks, reading a paper. He saw the train approaching, but thought there was room enough for it to pass him. The engine struck him, throwing his body against the guard surrounding the subway. The fence was carried away by the blow, and Mr. Ewing fell to the street surface. The Twelfth Precinct patrol wagon took him to St. Luke's Hospital. He died shortly after arrival there. Mr. Ewing was 67 years old, and leaves a widow and family in Wilkensburg, Pa.

AUGUSTUS S. BEMENT.

Col. Augustus S. Bement of E. Bement & Sons, Lansing, Mich., manufacturers of stoves and agricultural implements, and uncle of Mayor Arthur O. Bement of that city, died of heart disease while on his way home from the works on the 12th inst. He was a brother of the late E. Bement, founder of the extensive institution, and was 65 years old.

JOHN G. WEST.

John Gartrell West, mechanical engineer of the Reading Iron Company, died at his home at Reading, Pa., on the 9th inst. The deceased was born at Cornwall, England, on May 28, 1822. Forty-five years ago he came to the

United States, and for a time served as engineer on one of the Ohio River steamboats. Later he entered into partnership with Richard Corson and Samuel Thomas, the firm name being Thomas, Corson & West, mechanical engineers of the Norris Works, Norristown, Pa. He designed and superintended the construction of the pumping engine for the Lehigh Zinc & Iron Company of Bethlehem, this being the largest stationary engine ever made in the United States up to that date. He was afterward engaged in the construction and erection of pumping and mining engines until 1878, when he became superintendent and manager of the Scott Foundry. This position he held until about three years ago, since which time he was employed as mechanical engineer of the Reading Iron Company.

ROBERT M. HAMILTON.

Robert M. Hamilton of the firm of Baker & Hamilton, San Francisco, died on the morning of May 3, after a long illness, having been paralyzed since November 24, 1892. The deceased, who was born in Airdrie, Scotland, was 63 years of age and came to California during the gold fever of 1849, and was one of the pioneers of that State. While engaged in mining he met the late Livingston L. Baker, and in 1853 the two formed a partnership, bought out a seed store in Sacramento and founded the well-known hardware and implement house of Baker & Hamilton. In December last, and while Mr. Hamilton was a very sick man, his partner, Livingston S. Baker, died. The interests of the firm have since been looked after by their respective sons, who are members of the house. On January 20 of this year the business was incorporated into a stock company, capitalized at $1,000,000, R. M. Hamilton being elected president, Wakefield Baker vice-president and Alexander Hamilton secretary. Mr. Hamilton was a member of the Society of California Pioneers. In mercantile circles he was held in high esteem and leaves a large fortune. The business will go on uninterrupted, this having been the purpose in forming it into a stock company.

Spiral Coil of Pipe 530 Feet Long.—An unusual job in pipe bending has just been finished by the Brooklyn Tube Bending Company of 75 York street, Brooklyn, N. Y. The pipe is 1 inch galvanized iron and is bent in the form of a flat spiral, 2 feet in diameter at the center and 17 feet extreme diameter, there being 17 turns 4 inches apart. The lengths of pipes are 18 feet long and are united by right and left hand threaded couplings. The coils are kept flat and in position by 32 radially arranged iron straps, placed in pairs, one each side of the coil and bolted together. The pipe was bent cold by a machine (which we trust shortly to be able to fully describe) arranged somewhat like the ordinary straightening machine. It is first forced through a cylinder of the same diameter as its outside and then passes between two semicircular guide rolls, also of the same diameter. These guide rolls can be set so as to produce any desired degree of curvature in the pipe passing between them. There is no flattening of the pipe, the true circular section being truly maintained. Under a water test of 120 pounds, although the contract only called for 50 pounds, there was no sign of leakage.

CORRESPONDENCE.

Aluminum Horse Shoes.

To the Editor: Like many others, I have read the wonderful tales in the papers, as to what the Russians, Germans and the Icelanders are doing with aluminum in the way of shoeing their horses. Determined that the American eagle should also flop its aluminum wings, the Bryden Horse Shoe Company with which I am connected, commenced experimenting with the metal some months ago.

Naturally we met with many difficulties. Workers in steel and iron expect every other metal to possess some of the same characteristics. The first billet our heater put into the furnace, he looked for it in a few moments and it had departed. That taught him that a steel heat would be resented by aluminum. When he discovered the proper heat, our roller soon found that the new metal would not stand the same reduction in the rolls that iron or steel would. It must be reduced but slightly at each pass, and to keep it good natured, it must be annealed frequently during the rolling.

So far we have not succeeded in rolling the metal into shoe shapes nicely, owing to our rolls reducing too rapidly. It can, however, very readily be cast into shoe shape. I have had one of my horses shod with the aluminum shoes, and cannot speak hopefully of it as the coming metal for that purpose. It wears away very rapidly, not lasting over a week or ten days on a dirt road, and breaking easily. I think it probable that an aluminum alloy may be produced that will prove more efficient. This, however, will add weight to the shoes, and they will be no more durable and perhaps but little lighter than featherweight steel shoes, while they will undoubtedly cost three or four times the price of steel shoes.

Our company will continue to experiment with the new metal, but I am firm in my belief that steel is the coming metal for horse wear. It is tough, tractable and cheap. It can be made into shoes weighing from 2 ounces up, and a good quality of metal can be worn as thin as a sixpence without breaking—which cannot be said of aluminum, either in Russia or America.

Yours truly,

OLIVER WILLIAMS.

CATASAUQUA, PA., May 9, 1893.

The programme of the meeting of the Iron and Steel Institute provides for the presentation of papers on "The Elimination of Sulphur from Iron," by J. E. Stead, and on "The Saniter Process of Desulphurization," by E. H. Saniter, on the 24th, and on "The Basic Process at Witkowitz," by F. Kupelwieser; on "Puddling Iron," by John Head, and on "A Recording Pyrometer," by Prof. Roberts Austin, on the 25th of May.

Freights in the California trade are cut very low by the competition via Panama. The difference from old rates from New York by rail is 30 cents on first and second classes, 25 cents on third, 20 cents on the fourth, 15 cents on the fifth, and 10 cents on all the rest. Steamship rates are: Class 1, $3; Class 2, $2.20; Class 3, $1.40; Class 4, $1.50; Class 5, $1.35; Class A, $1.35; Class B, $1.30; Class C, $1.15; Class D, $1; Class E, 75 cents. There is here a reduction from old rates running all the way from 5 cents to 8 cents per 100 pounds. The railroad cut is $60 per car of 10 tons, while the steamship rates are $80 per 10 tons lower than old rail rates. On second and third class there has been a reduction of $140 per car by rail and $160 by steamer. The following articles per special rates by rail: Wire, 40 cents; bar and rod iron, 30 cents; pitch and tar, 30 cents; hoop and band iron, 30 cents; wrought-iron pipe, 35 cents; billets and blooms, 30 cents; boiler and plate iron, 40 cents; ingots and cast-iron pipe, 30 cents; canned goods, 50 cents; rivets and nails, 30 cents; rosin, 30 cents; cement, 30 cents; manila and straw paper, 70 cents; hardware (carloads), 80 cents; hardware (less than carloads), $1.35; cotton piece goods (less than carloads), $1.35; dry goods and clothing (in boxes, less than carloads), $3.

A New Process of Tempering Steel.

After an extended series of experiments the American Spring Company of 99 Randolph street, Chicago, have perfected a process for tempering steel wire which overcomes many of the difficulties heretofore common. It is claimed that by means of this apparatus steel wire of any desired cross-sectional shape can be tempered uniformly; that the desired degree of hardness can be duplicated at any time; that there is no tendency to warp, and that the tempered wire is as bright and free from oxidation as it was before tempering.

The apparatus consists of a vertically arranged tube of such material as to be readily heated to the desired temperatnre by the passage of an electric current through it. The upper end of the tube is closed by a centrally perforated cap through which passes the wire to be tempered. The lower end of the tube enters the cooling bath. The tank holding the oil is so arranged that the oil flows upward at a constant speed.

It will be noted that no air comes in contact with the heated part of the wire and that there is no oxidation possible. The heated wire passes vertically into the oil without contact with any packing substance or any material to reduce its temperature. By reason of the flow of the chilling fluid a perfectly even temperature of the fluid is maintained at the point where the heated wire comes in contact with it. The flow of the oil parallel with the wire prevents the formation of gas bubbles upon the surface of the spring, which would prevent the even chilling of the metal, and would thereby cause the wire to "buckle." By the use of electricity the inner tube of the muffle can be kept at an even heat and under easy control.

The heat the wire should receive is first determined by experiment, and the number of ampères of current used is noted; this heat can then be duplicated at any time, not by the eye, but by the use of accurate instruments, thus insuring work of the same character. This process produces wire which leaves the hardening bath perfectly true and straight, without warp or buckle, having a bright surface free from all evidences of oxidation, and having an even temper.

Orders have been given at the Washington ordnance shops to construct an 8-inch gun, 50 caliber, high power, of steel. It will be what is known as the Hurst gun, of the built-up-type and hooped, and will be chambered to load with high explosives.

The Naval Review Fleets.

At the time of the naval review in April the daily newspapers published elaborate descriptions of the war ships then anchored in the North River, but these accounts were characterized by such a profusion of details that it was difficult for the mind of the reader to assimilate them. Now that the bustle of the occasion is past it may not be amiss to present an analysis of some of the principal features presented by the remarkable assemblage of vessels which participated in the review.

It is a notable fact that the class of vessels known technically as battle ships, constituting the main reliance of the great maritime powers for actual fighting purposes at sea, was practically without representation. Our own ships of this type are not yet completed, and abroad it is usual to keep these vessels in home waters, or, as in the case of the British squadron, in the Mediterranean, on stations of strategic importance. In the battle ship other qualities are necessarily sacrificed to some extent in order to gain great offensive and defensive power. In designing a ship the naval architect has at his disposal a given total displacement or weight, a certain part of which must be assigned to the hull, and if a very large part of the remainder be apportioned to the battery and to heavy armor, then the weight of the machinery and of the coal supply must be correspondingly curtailed in order that the limit of the total displacement allowed shall not be exceeded. Of the foreign ships present at the naval review the "Aquidaban" of the Brazilian navy was the only one classed as a battle ship. That she does not afford an example of the latest type is evident from the fact that she was completed about eight years ago, and her displacement is a little less than 5000 tons. She carries 4 9.2-inch guns, however, besides others of smaller caliber, and has compound armor with a maximum thickness of 11½ inches. The maximum thickness of the armor of our monitor "Miantonomoh," classed as a coast defense vessel, is also 11½ inches.

Approximating to the battle ship is the modern armored cruiser, represented by the British "Blake" and "Australia" and the Russian "Dimitri Donskoi" and "General Admiral." Of these the "Australia" has side armor 10 inches thick and athwartship armor bulkheads 16 inches thick, while the others are protected, either by belts or by casemates, with a maximum thickness of 7 or 8 inches.

A number of the vessels, both under our own and under foreign flags, were of the type known as protected cruisers, the protection provided usually taking the form of a protective deck of from 2 to 4 inches in thickness, to guard the engines and boilers. A deck of this kind has sloping ends and sides, the edge being thus carried below the water line.

Partially protected cruisers were also represented, the protection generally being similar to that just described, but of a lighter nature. There were also several unprotected cruisers and small vessels of other types.

In point of size the British cruiser "Blake," of 9000 tons displacement, surpassed all the others. Our armored cruiser "New York," not quite ready for service as yet, might fairly be compared with her. Next in size to the "Blake" was the "Kaiserin Augusta," a German protected cruiser of slightly more than 6000 tons displacement, completed last year, and possessing a peculiar interest as being a triple-screw vessel. Next in size were the "Dimitri Donskoi" of 5796 tons; the "Australia" of 5600 tons; the "Aquidaban" of 4950 tons; the Spanish protected cruiser "Reina Regente" of 4750 tons; the "General Admiral" of 4600 tons, and the French protected cruiser "Jean Bart" of 4160 tons. The largest vessel present under the United States flag was the "Baltimore" of 4600 tons, followed closely in size by the "Chicago" of 4554 tons, and then by the "Philadelphia" of 4324 tons, and by the "Newark" and the "San Francisco," each of 4083 tons, all being protected cruisers except the "Chicago," a partially protected cruiser.

Of all the naval vessels participating in the review, the one having the highest record in point of speed was the Argentine protected cruiser "Nueve de Julio" of 3500 tons displacement and 14,500 indicated horse-power, completed in 1892. She was built in England by the well-known firm of Sir W. G. Armstrong, Mitchell & Co., and on trial, with forced draft, made 22.74 knots. With natural draft the mean of several measured mile runs gave a trifle over 22 knots. Of the other foreign vessels those credited with speeds of 20 knots or more were the British "Blake," the German "Kaiserin Augusta" and the Spanish "Reina Regente" and "Nueva Espaſia," the latter being a torpedo vessel. The two fastest vessels of the United States naval review fleet were both of special type, one being the torpedo-boat "Cushing," with a record of 22.5 knots, serving as tender to the commander-in-chief, Admiral Gherardi, and the other being the dynamite gun vessel "Vesuvius," having a speed of 21.6 knots. Of the cruisers, the "Baltimore" has a record of 20.1 knots, and the "Philadelphia" the "San Francisco" and the "Newark" have all made between 19 and 20 knots.

With two exceptions, all of the foreign vessels have been completed within the past ten years, and eight of them have been completed within the past two years. Of our own vessels, the oldest, the "Dolphin," was completed in 1885.

In most cases the main battery was composed chiefly of guns of about 6-inch caliber, with a few heavier ones on board some of the vessels. The largest were 10-inch guns, four of this caliber being mounted on board the "Miantonomoh" and two each on board the Italian cruisers "Etna" and "Giovanni Bausan." The Spanish cruiser "Reina Regente" had four 9.45-inch guns. Next in caliber were the 9.2-inch Armstrong guns, of which the British cruisers "Blake" and Australia" each carried two and the Brazilian battle ship "Aquidaban" carried four. The Russian armored cruisers "Dimitri Donskoi" and "General Admiral" both had 8-inch guns in addition to those of 6 inch caliber, and 8-inch guns were also to be seen on board several of the United States vessels. Our ships, as a rule, throw a heavier total weight of metal than foreign vessels of corresponding size. This fact affords a better indication of their relative offensive power than can be obtained by comparing simply the caliber of the guns carried.

It is announced that the annual reunion of the members of the Amalgamated Association of Iron and Steel Workers will not be held this year. Heretofore it has been customary to hold this reunion on the first Saturday following the opening of the annual convention, it taking the form of a reception to the visiting delegates. It is stated that the reason why the reunion will not be held this year is on account of the railroads being unable to furnish cars for transportation, on account of heavy travel to the World's Fair.

Southern Freight Rates.

The Queen & Crescent Route has issued Tariff No. 33, effective May 1, covering rates on pig iron in carload lots from Southern furnaces to points North, South and West. The rates between some of the more important points in carload lots of not less than 17½ tons of 2268 pounds are given below:

To	From— Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga., and Fort Payne, Ala.	Birmingham District.	Decatur, Florence and Sheffield, Ala.
Addyston, Ohio....	$2.05	$2.25	$2.50	$2.75	$2.50
Akron, Ohio.	3.15	3.35	3.60	3.85	3.60
Alliance, Ohio.....	3.15	3.35	3.60	3.85	3.60
Anderson, Ind.....	2.80	3.00	3.25	3.25	3.00
Ashland, Ky.....	2.35	2.55	2.80	3.05	2.80
Ashtabula, Ohio...	3.25	3.45	3.70	3.95	3.70
Atchison, Kan.....	4.80	5.00	5.00	5.00	....
Aurora, Ill.....	3.40	3.60	3.85	3.85	3.60
Brazil, Ind	2.80	3.00	3.25	3.25	3.00
Buffalo, N. Y	3.70	3.90	4.15	4.40	4.15
Burlington, Iowa..	3.40	3.60	3.85	3.85	....
Canal Dover, Ohio.	3.15	3.35	3.60	3.85	3.60
Canton, Ohio.....	3.15	3.35	3.60	3.85	3.60
Charleston, W. Va.	2.79	2.99	3.24	3.49	3.24
Chicago, Ill.....	3.40	3.60	3.85	3.85	3.60
Cincinnati, Ohio...	2.05	2.25	2.50	2.75	2.50
Cleveland, Ohio...	3.15	3.35	3.60	3.85	3.60
Columbus, Ohio....	2.65	2.85	3.10	3.35	3.10
Council Bluffs, Iowa	5.00	5.00	5.00	5.00	....
Crawfordsville, Ind	2.95	3.15	3.40	3.40	3.15
Davenport, Iowa..	3.40	3.60	3.85	3.85	....
Dayton, Ohio.....	2.40	2.60	2.85	3.10	2.85
Decatur, Ill.....	3.00	3.20	3.45	3.45	3.20
Defiance, Ohio	2.95	3.15	3.40	3.65	3.40
Denver, Col	7.06	7.06	7.06	7.06	....
Des Moines, Iowa..	5.33	5.53	5.78	5.78	....
Detroit, Mich.....	3.40	3.60	3.85	3.85	3.60
Dubuque, Iowa	3.84	4.00	4.25	4.25	4.00
Duluth, Minn.....	5.09	5.29	5.54	5.54	5.29
East St. Louis, Ill..	2.80	3.00	3.25	3.25	....
Evansville, Ind....	2.30	2.50	2.75	2.75	....
Fort Wayne, Ind..	3.05	3.25	3.50	3.50	3.25
Girard, Ohio.....	3.25	3.45	3.70	3.95	3.70
Goshen, Ind	3.40	3.60	3.85	3.85	3.60
Grand Rapids, Mich	3.65	3.85	4.10	4.10	3.85
Hamilton, Ohio....	2.25	2.50	2.75	3.00	2.75
Hamilton, Ont....	3.90	4.10	4.35	4.60	4.35
Houghton, Mich...	4.94	5.14	5.39	5.39	5.14
Indianapolis Ind..	2.80	3.00	3.25	3.25	3.00
Ironton, Ohio.	2.76	2.96	3.21	3.46	3.21
Johnstown, Pa.....	4.00	4.20	4.45	4.70	4.45
Joplin, Mo.....	5.00	5.00	5.00	5.00	....
Kalamazoo, Mich..	3.50	3.70	3.95	3.95	3.70
Kansas City, Mo...	4.80	5.00	5.00	5.00	....
Lancaster, Ohio....	2.75	2.95	3.20	3.45	3.20
Louisville, Ky... .	2.05	2.25	2.50	2.50	2.25
Memphis, Tenn	2.00	2.00	2.00	2.00	....
Milwaukee, Wis. (Rail and water.).	3.40	3.60	3.85	3.85	3.60
Milwaukee, Wis. (All rail.).....	3.80	4.00	4.25	4.25	4.00
Minneapolis, Minn.	4.94	5.14	5.39	5.39	5.14
Montreal, Ont.	5.15	5.35	5.60	5.85	5.60
New Castle, Pa....	3.21	3.45	3.70	3.95	3.70
Niles, Ohio.....	3.25	3.45	3.70	3.95	3.70
Omaha, Neb.....	5.00	5.00	5.00	5.00	....
Ottumwa, Iowa....	4.83	5.03	5.28	5.28	....
Peoria, Ill	3.30	3.50	3.75	3.75	3.50
Peru, Ind.....	3.0	3.25	3.50	3.50	3.25
Piqua, Ohio	2.80	2.80	3.05	3.30	3.05
Pittsburgh District, Pa.....	3.70	3.90	4.15	4.40	4.15
Pueblo, Col	7.06	7.06	7.06	7.06	....
Quincy, Ill..... ...	3.40	3.60	3.85	3.85	....
Richmond, Ind.....	2.75	2.95	3.20	3.20	2.95
Rock Island, Ill....	3.40	3.60	3.85	3.85	....
St. Joseph, Mo.....	4.80	5.00	5.00	5.00	....
St. Louis, Mo.....	2.80	3.00	3.25	3.25	....
St. Paul, Minn.....	4.94	5.14	5.39	5.39	5.14
Sandusky, Ohio....	2.95	3.15	3.40	3.65	3.40
Sharon, Pa.....	3.25	3.45	3.70	3.95	3.70
Sioux City, Iowa..	5.00	5.00	5.00	5.00	....
South Bend, Ind...	3.40	3.60	3.85	3.85	3.60
Springfield, Ill.....	3.15	3.35	3.60	3.60	....
Springfield, Ohio..	2.50	2.70	2.95	3.20	2.95
Steubenville, Ohio.	3.70	3.90	4.15	4.40	4.15
Terre Haute, Ind	2.70	2.90	3.15	3.15	2.90
Topeka, Kan.....	6.59	6.59	6.59	6.59	....
Wabash, Ind.....	3.05	3.25	3.50	3.50	3.25
West Superior, Wis.	5.09	5.29	5.54	5.54	5.29
Youngstown, Ohio	3.25	3.45	3.70	3.95	3.70
Zanesville, Ohio....	3.05	3.25	3.50	3.75	3.50

PERSONAL.

H. H. Sprague, who for 25 years has been superintendent of the plant of H. K. Porter & Co., builders of light locomotives at Pittsburgh, has tendered his resignation, to take effect on July 1 next. E. R. Lord, recently superintendent of motive power of the Cleveland, Columbus, Cincinnati & St. Louis Railroad Company, has been named as Mr. Sprague's successor.

Riccardo Grassi of Milan, Italy, where he is the representative of some leading European manufacturers, is now visiting this country. Mr. Grassi is desirious of arranging with a prominent American house to represent them throughout Europe. He is well known among the metal trades of the Continent.

Edgar Watts of Cumberland Gap, Tenn., G. I. Whitney of Pittsburgh, Pa., and J. C. Potter of Pittsburgh are candidates for membership in the Iron and Steel Institute.

E. Windsor Richards is to be the new president of the Iron and Steel Institute.

A new movement against trusts is the convention to be held at Chicago on June 5 and 6, composed of delegates selected by Governors of States, in accordance with a call issued by the Governor of Minnesota, acting under instruction of the Legislature of his State. Announcement is made that 26 States have already been favorably heard from. It is therefore likely that the convention will be well attended, as many of the other States will also send delegates. The people of Minnesota have been waging a bitter war against a combination of coal dealers, and they are evidently determined to push fighting all along the line, but believe that greater results can be accomplished if other States co-operate. The meeting will be an interesting one and may have important results.

The superiority of the products of American manufacturers over those of other countries was again demonstrated on the 10th inst. by Fraser & Chalmers giving their order to the Diamond Clamp & Flask Company, Richmond, Ind., for a shipment of their clamps and flasks to their London shops, London, England.

Niagara Falls is to have a new iron observation tower 290 feet in hight. The old tower was removed some time since because its foundation was considered unsafe on account of the encroachment of the falls, which had approached to within dangerous distance.

Announcement is made that the trials recently made of the patent coke drawer in the Connellsville region, referred to in a previous issue, have demonstrated that it is not a success as at present constructed. The principal objection to the machine is that owing to the fact of Connellsville coke being much heavier than that of other fields the machine is not able to handle it. Another is that the changing of the ovens and the wear and tear of them by the use of the machine would more than offset the advantages claimed in favor of it.

The American Institute has decided to execute plans long contemplated and proceed at once to erect a new building on the site occupied by its present structure on Third avenue, New York, at a cost of fully $500,000. The building will comprise three sections, of which the principal will be the administration building, five stories high, fronting on Third avenue, and be 50 feet in width. At the rear of the administration building will be the great exhibition hall, 304 x 200 feet in size, and at the rear of that, separated by a heavy brick wall, will be Machinery Hall, 157 feet deep by 200 feet wide, these measurements being inside the walls. Thus, with the hallways and corridors, the mean depth of the structure will be 610 feet.

Four third-class torpedo boats for the armored cruiser "Maine" and the battle ship "Texas" are included in the plans for those vessels, and it remains to be decided whether they shall be built in Government or private yards.

The Government Board at Springfield, Mass., to whom is assigned the duty of securing a magazine gun for the use of the army, appears to have much difficulty in arriving at a satisfactory conclusion, although preparation is making. It is claimed that a portion of the $400,000 appropriated for the provision of the service with an arm is being expended on machinery intended for the making of the Krag-Jorgensen gun. This expenditure, it is said, will be wasted in case that arm is not finally adopted.

The Craver & Steel Mfg. Company of Harvey, a manufacturing suburb of Chicago, have just completed a shipment of 38 cars of harvesting machines to the Argentine Republic. The consignments go via New York.

The Bucyrus Steam Shovel & Dredge Company have removed their business from Bucyrus, Ohio, to South Milwaukee, Wis., where their new works are situated. South Milwaukee is ten miles south of the city of Milwaukee, on the line of the Chicago & Northwestern Railway. The new plant was built in 1892, and covers 13 of the 15 acres comprising the site. The two remaining acres, which are located on the harbor on the lake shore, will be used as a shipyard, and are connected with the main works by a belt line railroad. The buildings are of steel, brick and glass, and are heated by the hot-blast ventilating system and lighted entirely by electricity. The power is distributed from a central power house by electricity to the various buildings, and two multipolar generators, each of 150 horse-power, driven by a cross-compound Corliss engine, are employed. The machine shop and foundry are equipped with electric traveling cranes, while the auxiliary cranes for the machine tools are served by compressed air. The entire works are fitted with the most improved and modern methods to insure the systematic and economic production of machinery.

Inventors are allowed until June 15 to submit designs for the proposed submarine war vessel.

W. L. Starr & Co. of Newark, N. J., keep 40 hands busy manufacturing whip sockets and dash fixtures, besides some special carriage mountings.

MANUFACTURING.

Iron and Steel.

The Wheeling Steel & Iron Company of Wheeling, W. Va., will soon commence to make some important improvements and additions to the Wheeling Steel Works. The contracts for considerable of the machinery to be used in the remodeling of the plant have been awarded to the Fischer Foundry & Machine Company of Pittsburgh. Other extensive changes at other plants of the Wheeling Steel & Iron Company are also contemplated, but have not been fully decided upon. If the plans now under consideration are carried out it is probable that this concern will be in the market before long as manufacturers of structural material of various kinds.

Both furnaces of the Lady Ensley Coal, Iron & Railway Company at Sheffield, Ala., were banked on May 1. In view of the fact that the company recently went into the hands of receivers, it is somewhat uncertain when the furnaces, which are heavy producers of coke iron, will resume.

At the annual meeting of the stockholders of the Chateaugay Ore & Iron Company, held at Lyon Mountain, N. Y., the following officers were chosen: Trustees, Smith M. Weed, James M. Burden, James P. Dickson, Francis J. Dominick and Robert M. Olyphant. Inspectors of election, M. F. Parkhurst and George S. Weed.

The Capital Sheet Metal Company of Columbus, Ohio, have been chartered, with a capital of $100,000, and will engage in the manufacture of sheet-metal products.

At Cleveland, Ohio, on May 6, W. J. Rainey, a Connellsville coke operator, filed a bill in equity for $13,950.96 against the Thomas Furnace Company of Niles, Ohio, on a contract for coke made in 1891. The plaintiff charges that the defendants did not fulfill their agreement in buying from him their entire supply of coke. On account of this he asks $780, as a profit on 12,000 tons of material.

The work on the plant of the Hercules Pipe Works, at Anniston, Ala., is being rapidly pushed to completion. The foundations are completed and the boilers, stacks, flasks, patterns and a great deal of the machinery has arrived, and the officials of the company state that they hope to be in operation by July 1. This plant was formerly located at Peli City, Ala.

The Crozer Iron Works, near Roanoke, Va., reduced the wages of their employees last week 10 per cent. and the reduction has been accepted.

The Philadelphia Engineering Works, Limited, have contracted with the Poughkeepsie Iron Company for a complete blast-furnace plant at Poughkeepsie, N. Y. The plant will be equipped with three 19 x 60 foot Gordon-Whitwell-Cowper fire-brick hot-blast stoves, three Corliss valve horizontal blowing engines, 84-inch diameter of blast cylinder, 50-inch diameter of steam cylinder, 72-inch stroke, of their latest patterns and designs; 1200 horse-power of Stirling water-tube boilers, and all the pumps and piping necessary for the plant. The whole work will require about 1,000,000 fire brick, the orders for which have been placed with C. N. Christie of Poughkeepsie, N. Y., and John B. Marie. The plant is to be completed and ready for operation the latter part of October.

Boston Bridge Works, Boston, Mass., have recently completed buildings for Washburn & Moen Mfg. Company, Worcester, Mass., one 120 x 256 feet and one 120 x 272 feet, two and three stories. The buildings are to be used as wire mills, and the frame work is exceptionally heavy and the sides of glass.

J. H. Sternbergh & Son of Reading, Pa., are making a good exhibit at the World's Fair. A large portion of the exhibit, composed of bolts, nuts, rivets, &c., is contained in section 2, block 2, in the Manufactures Building. Their railroad goods, track bolts, &c., are shown in section XN, Post 11, in the Transportation Building and their belt-lacing machine is to be seen in the Machinery Building, section 32, column P, 49.

The New York office of the Riverside Bridge & Iron Works, whose plant is located at Paterson, N. J., has been removed to 61 Broadway.

The consolidation of the business interests of the Ætna Iron & Steel Company and the Standard Iron Company of Bridgeport, Ohio, has been concluded, and the busi-

ness of both concerns is now being carried on under the name of the Ætna-Standard Iron & Steel Company. Offices of the consolidated concern are located in the buildings formerly occupied as offices by the Ætna Iron & Steel Company. The consolidated mills will have an annual finished capacity of 80,000 tons, and will carry a large stock of their full line of products, thus insuring prompt shipments. The officers of the company are as follows: W. T. Graham, president; Jno. A. Topping, secretary; J. J. Holloway, treasurer, and B. M. Caldwell, general manager.

Elk Rapids Furnace, at Elk Rapids, Mich., has blown out to put in a new hearth. The old hearth lasted two years, and over 40,000 tons of pig iron was made on it. The furnace will start up again as soon as the repairs are completed.

Belmont Furnace, at Wheeling, West Va., will be blown out at an early date for the purpose of making repairs. The stack will be relined and otherwise improved.

A new addition, 50 x 200 feet, two stories high, has been completed to the works of the National Wire & Iron Company, at Cleveland, Ohio. The capacity of the works will be nearly doubled when the new structure is in operation.

The old Lemont blast furnace in Fayette County, Pa., has been destroyed by dynamite. It was at one time successfully operated by R. Hogsett & Co. Part of its machinery was used in building the Trussville Furnace in Alabama.

It is stated that the Pacific Iron & Nail Works, at Oakland, Cal., will suspend operations within a few days, and that there is reason to believe that the works will never be opened again for the purpose for which they are now used. It is further stated that the proprietors are considering the advisability of a change of location.

It is stated that the Crown Point Iron Company of Crown Point, N. Y., have settled the suit brought against them for failing to comply with the "weekly payment law" by paying $200 penalty into the State Treasury and stipulating to make weekly payments to their employees on and after June 1. The Chateaugay Ore & Iron Company of Plattsburg, N. Y., have made a like settlement on the same terms.

The Cherry Valley Iron Works, Leetonia, Ohio, manufacturers of pig, muck and bar iron, are making some radical changes in heating furnaces, and are also changing their 16-inch mill from two-high finishing to three-high.

The Brown-Bonnell Iron Company, Youngstown, Ohio, are making plans for a new warehouse with outside platform, &c. It will be from 80 to 90 feet wide and about 400 feet long. Work on the new building will be commenced at an early date.

Machinery.

The Leechburg Foundry & Machine Company, Pittsburgh, have received an order from the Minneapolis Rolling Mill Company of Minneapolis, Minn., for a No. 2 bar shear and also for a 26-inch roll lathe of new design. The first named firm have recently commenced the manufacture of chilled and sand rolls and have recently received orders for this class of product from Wallace, Banfield & Co., Limited, Irondale, Ohio, and the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., and others.

Charles Bruner of Peru, Ill., is completing a one-story annex to his large foundry. The addition, which is 30 x 70 feet, will be devoted to the manufacture of gas and gasoline engines, on the construction of which he holds a number of patents.

Tinius Olsen & Co. of Philadelphia are exhibiting at the World's Fair a line of their celebrated testing machines, as follows: One 100,000-pound autographic machine; one 100,000-pound automatic machine; one 40,000-pound spring testing machine; one 7000-pound tortional and shaft testing machine; one 30,000-pound Little Giant testing machine; one 10,000-pound wire testing machine; one cement testing machine; one transverse testing machine; one textile testing machine. The exhibit also contains instruments for recording expansion, compression and deflection, and micrometers for recording extensions, compressions or deflections. The concern have recently booked an order from the Carnegie Steel Company, at Homestead, for a 200,000-pound testing machine.

The Stark Machine & Tool Company of Buffalo, N. Y., report that they have taken contracts for furnishing machinery for the following novelties: Sudduck's rain-water cut-off, Lawrence patent conductor elbow, McKim sheet-metal dry measure, New Era conductor pipe, Novelty sheet-metal ceiling, new eave trough, and Elistac toy cannon.

Chas. L. Rowland's machine shop at Greenpoint, L. I., has been damaged by fire to the amount of $45,000.

Graham Brothers' foundry and machine shops at Worthington, Ind., were burned recently, at a loss of $20,000. No insurance.

J. C. O'Donnell of Sheldon, Iowa, has concluded arrangements with Whitewater, Wis., parties, whereby he removes his foundry to that place. A corporation is to be formed with a capital stock of $75,000.

Young & Thatcher's car-wheel foundry, at Elizabethport, N. J., has been burned. The loss is placed at $8000. Valuable patterns were destroyed.

Stearns, Rogers & Co. are making some extensive improvements to their foundry and machine shop at Pueblo, Col.

Robinson & Irwin will soon commence the erection of a new machine shop at Steubenville, Ohio.

Phillip Carroll and Alfred Butler have entered into partnership for the purpose of operating a foundry and machine shop at Houghton, Mich.

The B. Hoffman Mfg. Company have been incorporated at Milwaukee, Wis., with a capital of $75,000, to operate an iron and brass foundry and general machine shop. The plant of the former Hoffman & Billings Company has been purchased, and will be remodeled to meet the requirements of the new concern.

The Danville Foundry & Machine Company of Danville, Ill., have increased their capital stock from $25,000 to $40,000.

The Sioux City Engine Works, Sioux City, Iowa, are working on a plan of reorganization which, it is said, if carried out successfully will leave the company in good condition and easily able to continue their business.

The strike of molders at the Clinton Foundry, Troy, N. Y., has been declared off and the men have returned to work. It is understood that mutually satisfactory arrangements have been made between the management and the employees.

The Louden Machinery Company, at Fairfield, Iowa, are building a new blacksmith and machine shop 66 x 32 feet, two stories high. The new addition increases the floor space of the company's plant to 18,000 square feet.

The D. Frisbie Company, manufacturers of the Frisbie elevators, of New Haven, Conn., have been reorganized and a new charter applied for. The new company will be known as the Frisbie Elevator & Mfg. Company, and the capital stock will be $70,000, all fully paid up. The company will start in at once to improve and extend their works. A large amount of new machinery is to be purchased and other facilities are to be added, so that they can greatly increase their capacity for producing goods. It is said that they also contemplate the building of a Western factory. The company own a large number of patents pertaining to elevators and hoisting machinery, one of the most important being the new direct electric elevator, the invention of W. H. Frisbie. They also make a friction clutch well known throughout the trade.

The Toledo Nut Lock Company of Toledo, Ohio, have been granted a charter, with a capital of $100,000, and will engage in the manufacture of nut locks and other mechanical devices.

The Hazard Mfg. Company of Wilkesbarre, Pa., through N. P. Hyndman, Pittsburgh representative, have just furnished a wire rope to the Pittsburgh & Castle Shannon Railroad Company, which measures 1⅛ inches in diameter, and weighs about 8000 pounds. The same concern have a contract for a rope of the same diameter, to be used on the freight plane of the Monongahela Incline Plane Company at Pittsburgh. The latter rope is to replace safety rope furnished by the same company in 1882.

Heyl & Patterson of Pittsburgh have secured a contract from the Cambria Iron Company, Johnstown, Pa., for the construction of a plant for storing, breaking and distributing coal used in mechanical stokers. The plant will have a capacity of 600 tons per day.

The Akron Boiler Company of Akron, Ohio, have been granted a charter of incorporation, with a capital of $100,000. The new concern will engage in the manufacture and sale of boilers, steel and iron tanks and wheelbarrows.

Miscellaneous.

Theodore M. Baker, who represents the firm of Randolph & Clowes of Waterbury, Conn., in Philadelphia, has received from the Pennsylvania Railroad the contract for furnishing the sheet copper with which the roof, cornices and panel work of the new train shed of the Pennsylvania Railroad now building at Broad and Market streets will be covered. The contract will amount to nearly $25,000 and is the largest single order ever placed in Philadelphia. The copper rolling mill is Randolph & Clowes' youngest department. During the past few months they have been running almost every night until 10 o'clock. Now they are running day and night, with a double force of hands.

For some time the owners of a large foundry have been in communication with William Lawton of Kingston, N. Y., regarding the matter of locating their plant in that city. He has offered to build for them. They desire railroad facilities, as they will receive from 5 to 10 tons of raw material a day and also have a large output. They will cast principally supplies for plumbers and steam fitters in New York trade, and will employ 100 men. If the plant is located at Kingston a foundry, office and machine shop, a building for making cores and a cleaning and finishing plant will be erected.

The Iona Mfg. Company, makers of electrical goods, have removed from 41 Federal street to 336 Congress street, Boston, where they have a factory containing about 7000 feet of floor space.

The Western Brass Mfg. Company of St. Louis, Mo., have signed a contract to locate their works at Gas City, Ind.

The National Supply Company have been incorporated at Minneapolis, Minn., with a capital stock of $500,000. The new plant, when in operation, will manufacture all kinds of light and heavy machinery and mechanical devices under patents. The incorporators are Pliny W. McAllister, Chet T. Horgen and Charles B. Davis.

Among newly authorized corporations in Illinois are the following: Quincy Steel Range Company, at Quincy; capital stock, $10,000; for manufacturing; incorporators, Lemuel C. Ross, Edward J. Drake and Adam H. Govert. The Dearborn Refining Company, at Chicago; capital stock, $30,000; for a general metallurgical business; incorporators, J. R. Dickinson, W. D. Millard and H. P. Smith. Sloss-Stein Electric Company, at Chicago; capital stock, $50,000; for manufacturing; incorporators, Sydney Stein, Aaron M. Sloss and Louis Stein. The Edwin S. Jackman Company, at Chicago; capital stock, $50,000; for the manufacture of railroad supplies; incorporators, Edwin S. Jackman, Albert W. Barnum and Henry C. Latsh. The Noteman Gas Generator Company, Chicago; capital stock, $100,000; incorporators, A. Noteman, Will R. Burritt and Day O. Crane. Silberhorn Refrigerator Car Company, Chicago; capital stock, $100,000; incorporators, William H. Silberhorn, John J. Silberhorn and Frank O. Weeks. Polo Electric Light Union, Polo; capital stock, $12,000; incorporators, Morton D. Swift, Horatio Wales and Daniel W. Beard.

The Schenectady Locomotive Works of Schenectady, N. Y., have contracted to build eight consolidation engines for the St. Paul, Minneapolis & Sault Ste. Marie Railroad.

Bowers, Galpin & Co. of Binghamton, N. Y., manufacturers of gutters, gutter pipe, roofing, &c., are about to build a new factory. The structure will be 600 x 150 feet, one story in hight.

The Oswego Machine Works, capitalized at $60,000, have filed articles of incorporation at Albany. The company propose to establish works at Oswego, N. Y. for the manufacture of printers' and bookbinders' machinery.

A notable novelty in the machinery of the "Campania" is the addition of what is called an emergency governor. In the event of a fracture of the propeller shaft, or upon anything occurring which would result in the racing of the screw beyond, say, 130 revolutions per minute, the governor will act upon the reversing gear, place the eccentric links into midgear, and thus stop the engines.

TRADE REPORT

A very conservative spirit pervades the entire Iron and Steel trade, the principal occupation of many manufacturers and dealers being to stimulate the collection of outstanding accounts and at the same time delay payments to others. Sharp dunning on the one hand and clever dodging on the other are popular arts just now.

It is undeniable, however, that the worst fright is over, and that a better feeling will quickly develop if the next few weeks should roll by without further disasters. There have been a number of encouraging features during the past week, conspicuous among which are larger sales of Steel Rails in Chicago and an upward movement in Bessemer Pig and Billets in the Pittsburgh district. There is considerable activity, too, among the Western rolling mills to provide for an accumulation of stock, so as to meet the contingency of a stoppage caused by labor troubles.

As yet the expected purchases of Ore for the Chicago district have not been announced, but some color is given to the statements so often heard during the last two months that an effect upon the Ore market was aimed at by a leading Pittsburgh interest by depressing Bessemer Pig and Billets. That concern is now credited with purchases of 20,000 tons of the former. In sympathy therewith Billets have also risen 50 cents per ton for early delivery.

It is intimated in some of the leading markets that the fierce struggle in the Structural trade between two large Pittsburgh concerns has moderated, the order books being supposed to be in pretty fair shape for the present.

Manufacturers in Eastern Pennsylvania have been astounded at the low price at which a 1000-ton order for Plates has been captured by a Pittsburgh concern, thus carrying the war into Africa.

In the Bar trade the Western producers are showing a disposition to withdraw extreme quotations.

The Chicago market has witnessed the closing of about 60,000 tons of Rails within the last two weeks.

The Eastern mills have been doing little lately, and in light sections are contending against extremely low quotations which Pittsburgh is making.

The weak-kneed have not yet lost their pernicious influence upon the trade in Southern Foundry and Mill Pig Iron, Chicago as well as other Western markets having been the scene of offers at unprecedentedly low prices lately. The mournful business of record breaking cannot go on much longer.

Copper statistics, which we present elsewhere, show that production has jumped to an uncomfortable rate. It may be questioned whether the market can stand a monthly product of nearly 13,000 gross tons. Tin has had a sensational drop. Lead is weak, and Spelter seems destined to have some very miserable months.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., May 16, 1898.

Any fairly accurate report of the Iron and Steel trade must necessarily be monotonous in times like these. Prices are down to a point below which they cannot be driven in ordinary transactions; but while the present stringency in money continues it is just as difficult to attempt an advance. Consequently things drag along at the same old prices, a little less, perhaps, when there is a forced sale, but to all intents and purposes the situation is unchanged. The same may be said in regard to prospects, for as far as any one can see—which is not very far these days—there is nothing to change the opinions expressed for several weeks past—viz., that the demand would be better if money was easier, and with a better demand prices would stiffen. These are contingencies, however, which every one must judge for himself. The Iron trade is all right if it is given a fair chance, but it cannot change to any important extent until its environments change. So far as the past week is concerned nothing has occurred to cause further depression, neither is there anything in sight likely to cause any immediate improvement.

Pig Iron.—Last week's report would exactly define the situation to-day, except that sellers think their position is strengthened by an anticipated advance in freights from the South, which is expected to go into effect June 1. Apart from this, business moves along on the same lines as before, good Irons being scarce and in demand at full prices, others not specially abundant, but plenty enough to keep prices at their former limits, which, as the trade well understand, is little, if anything, over $12, $13 and $14 for the three grades of Alabama Irons, including also some from Virginia. Nominally prices are a trifle above these figures, but in good-sized lots a first-class buyer has no difficulty in getting all the Iron he wants at the prices named. It has been supposed that most of the Iron held for advances has been pretty well cleaned up, but as every week seems to produce a new lot from some source or other, it cannot be that supplies are completely exhausted. Nevertheless, there is no general pressure, so that it is probably true that no large lots are around, which would leave the market in good shape to respond to any improvement in general conditions. For the present, however, business is confined chiefly to covering immediate requirements, and usually at prices about as follows for Philadelphia and equivalent deliveries, with 25¢ @ 50¢ less on Southern brands at Harrisburg and intermediately to Baltimore:

American Scotch, No. 1X...	$16.00	@	$16.50
American Scotch, No. 2X...	15.00	@	15.50
Standard Penna. (Lake Ore), No. 1x	14.75	@	15.25
Standard Penna. (Lake Ore), No. 2x	14.25	@	14.50
Standard Virginia, No. 1x...	14.50	@	14.75
Standard Virginia, No. 2x..	13.50	@	13.75
Virginia and Southern, No. 1x, Soft	14.00	@	14.25
Virginia and Southern, No. 2x, Soft	13.25	@	13.50
Standard Penna. and Virginia Forge	13.00	@	13.25
Ordinary Forge	12.25	@	12.50

Freights.

Alabama Furnaces, Rail to Philadelphia	$4.31	@	.....
Alabama Furnaces, Rail and Water to Philadelphia	4.01	@	....
Alabama Furnaces, Rail to Baltimore and Harrisburg	4.06	@	....
Virginia Furnaces, Rail to Philadelphia	2.25	@	$2.75
Virginia Furnaces, Rail to Harrisburg	1.50	@	2.00
Virginia Furnaces, Rail to Baltimore	1.75	@	2.25

Steel Stock.—Furnaces in this vicinity are closely sold up, and as Ores are both scarce and dear there is no inducement to continue production at such prices as buyers are willing to pay—say $15 @ $15.25 for Standard Bessemer and $17.25 @ $17.50 for Low Phosphorus.

Steel Billets.—Consumers are extremely cautious in making bids, and as they are fairly supplied up to midsummer it has been found impossible to do much business. Asking prices for Western Steel are $23.50 @ $23.75, delivered, but on lots of 1000 tons and upward $23.25 usually finds acceptance. The feeling is one of hesitancy—not specially weak; but owing to uncertainty in regard to the situation buyers hold off as long as they can.

Steel Rails.—Not very much demand for Tees, but mills have sufficient orders to run them to about midsummer. There is an active demand for Girder Rails, orders for which are hard to place for quick delivery, quotations varying from $33 to $35 at mills.

Muck Bars.—The demand is not active, although $22.50 @ $22.75, f.o.b. cars sellers' mills, is obtainable for such lots as consumers happen to want.

Bars.—There is no improvement in this department of the Iron trade. Some mills have a fair demand for their specialties, which command comparatively good prices, but for good, ordinary Iron extremely low figures are quoted, nominally 1.60¢ @ 1.65¢, but on 100 ton lots lower figures are frequently accepted, and for interior deliveries 1.55¢, and sometimes less. Steel Bars, 1.60¢ @ 1.85¢, according to quality.

Plates.—The trade try to think that things are improving, but when a special order is under competition they are compelled to think differently. A case in point was the bidding for 1000 tons of Steel Plate for a gas holder, to be built by R. D. Wood & Co. Local mills made what they considered extremely low prices, considering the exacting character of the order, "but the next day it snowed," Pittsburgh taking the order at a figure which—if manufacturers hereabout know anything about cost—will net a loss very close to $5 ℔ ton. Harrisburg was successful in securing a 1500-ton order for the Roach Shipyard at Chester, and while the price must necessarily be a low one, it is not thought to be anything like the one previously mentioned. Small orders are somewhat numerous, so that on the whole the Plate trade holds its own very fairly. Prices are supposed to be about as follows, but on large lots special rates are quoted:

	Iron.	Steel.
Tank Plates	1.80 @ 1.85¢	1.80 @ 1.85¢
Shell		2.10 @ 2.20¢
Flange	2.70 @ 2.90¢	2.25 @ 2.40¢
Fire Box	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities		3.25 @ 3.75¢

Structural Material.—The demand is chiefly for small lots and usually at figures recently quoted. In large lots, however, prices are irregular, and on some desirable orders lower figures than ever have been quoted, although for small lots prices are about as follows: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.80¢ @ 1.85¢; Universal Plates, 1.80¢ @ 1.90¢.

Sheets.—There is a very fair demand, and mills are running up to their usual average. There is some cutting on

common qualities, but best makes command about the following prices :

Best Refined, Nos. 14 to 20....2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26....3.15¢ @ 3.20¢
Best Refined, No. 27..... ...3.30¢ @ 3.40¢
Best Refined, No. 28.....3.40¢ @ 3.50¢
Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than here named :

Best Soft Steel, Nos. 14 to 16...2½¢ @ 2⅝¢
Best Soft Steel, Nos. 18 to 20...2⅝¢ @ 3¢
Best Soft Steel, Nos. 21 to 24...3⅛¢ @ 3¼¢
Best Soft Steel, Nos. 25 to 26...3⅜¢ @ 3⅝¢
Best Soft Steel, Nos. 27 to 28...3⅝¢ @ 3⅞¢
Best Bloom Sheets, ¼¢ extra over the above prices.
Best Bloom, Galvanized, dis..... 70 and 5% @ 70 and 10%

Old Material.—All that can be said of the market is that it is extremely dull, and buyers hard to find at any price. For such lots as are required sales are made at about the following prices: Old Iron Rails, $17.50 @ $18, delivered; Old Street Rails, $19 @ $19.50; Old Steel Rails, $15 @ $15.50; No. 1 Railroad Scrap, $15 @ $16, Philadelphia, or for deliveries at mills in the interior, $15 @ $16, according to distance and quality; $8 @ $9 for clean new No. 2 Light Scrap; $7.50 for old No. 2 Light Scrap; $11.50 @ $12 for Machinery Scrap; $12 @ $12.25 for Wrought Turnings; $8 for Cast Borings, and nominally $22 for Old Fish Plates, and $13 @ $14 for Old Car Wheels.

Wrought-Iron Pipe.—Business is a trifle more active, and in some sizes there is comparative scarcity. On the whole prices are steadier than they have been, but on desirable orders it is not difficult to get an extra 5 % from the following discounts:

Butt-Welded Black.....57½ %
Butt-Welded Galvanized..... .... 50 %
Lap-Welded Black.....67½ %
Lap-Welded Galvanized.....57½ %
Boiler Tubes, 2¼ inches.....65 %
Boiler Tubes, 3 inches.....67½ %

Baltimore.

BALTIMORE, May 15, 1893.

The market in this section has been decidedly quiet since our last report; in fact, it resembles very closely the month of January, which will be long remembered by Baltimore people as being one in which almost no business was transacted. There is absolutely not one encouraging feature in the Iron and Steel market throughout the Southeast. Collections still remain extremely hard, business quiet, and close competition for what small orders that are to be placed. Why this should be so at this particular time when so much building is being planned for it is hard to say. Machine shops are particularly dull, some of them being almost at a standstill; others are taking contracts at figures which show their only desire is to keep their employees together.

Bars.—In spite of the dullness of business, in view of the rapidly approaching time for the annual strike, an inclination is noticed among the mills to somewhat stiffen prices; in fact, the mills making product whose quality is recognized as being standard are refusing orders at concessions heretofore gratefully agreed to. This stiffening not being universal, we continue to quote from mill 1.75¢ @ 1.80¢, and from stock 1.80¢ @ 2¢.

Plates.—Some few orders for low-grade material have been placed, but not enough to cause more than a passing attention. Nothing new has taken place as regards prices, for it is known that nothing can be expected in the way of reduction in prices, and the situation certainly will not warrant a stiffening. Our quotations are: Tank Steel, 1.80¢; Shell, 2.15¢ @ 2.25; Flange, 2.30¢ @ 2.40¢; Fire Box and Marine, 2.45¢ @ 2.55¢.

Merchant Steel.—With the exception of Tires, there has been almost nothing done in Merchant Steel. Of this particular line some orders have been placed which have been gratifying to those who have received same. There is no disposition to shade prices on this grade of material, as consumers immediately think when extremely low prices are quoted that the quality suffers, something it would be very gratifying to meet with in other Iron and Steel products. We quote Machinery Steel 2.10¢ @ 2.25¢; Tire Steel, 2.05¢ @ 2.15¢; Spring Steel, 2.40¢ @ 2.50¢; Toe Calk, 2.30¢ @ 2.40¢.

Tubes.—We can only say that, in regard to Tubes and Pipes, nothing is being done. No large contracts are in the market and none are expected; hence we are perfectly safe in repeating our regular quotations of 65 % off for 2¼ inch and smaller, 67½ % for 3 inch and larger from mill, and from stock 5 % better prices.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, May 17, 1893.

The general tone of the Pig Iron market is easy, with the general disposition on the part of the buyers not to anticipate their wants, so that no large sales have been made, and few run many months into the future, although the furnaces are willing to sell for the whole year on the basis of current prices, and we learn of one sale where the deliveries run for 12 months, or four months into next year. There has been a pretty satisfactory volume of business in the aggregate of small lots for immediate and short forward delivery, seldom more than three months, and of nearly all varieties of Southern Iron, but chiefly No. 2 Foundry and Gray Forge, with a fair quantity of No. 1 Soft. Prices of these grades have been more generally $8.75 for No. 2 Foundry and $7.75 for Gray Forge, f.o.b. Birmingham, prompt delivery and sharp cash. The financial situation is so stringent that those who can command the ready means are able to make these terms, and contend that they are entitled to them. There is a confident undertone to the market, and it looks as if it had found the bottom at last. There are some negotiations pending for Charcoal Iron, which may be consummated at an early day, but the transactions have been unimportant during the week. Many of the sales of Iron during the week were destined to the East, but the melting of Iron in this district is of fair volume. Quotations are as follows:

Foundry.

Southern Coke, No. 1.	$13.25 @ $13.50
Southern Coke, No. 2.....	11.75 @ 12.00
Southern Coke, No. 3.....	11.00 @ 11.25
Ohio Soft Stone Coal, No. 1....	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2 ...	15.00 @ 15.25
Mahoning and Shenango Valley	14.75 @ 15.00
Hanging Rock Charcoal, No. 1..	19.00 @ 19.25
Hanging Rock Charcoal, No. 2..	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 1.....	15.50 @ 15.75
Tennessee and Alabama Charcoal, No. 2.....	14.50 @ 14.75

Forge.

Gray Forge.....	10.75 @ 11.00
Mottled Neutral Coke.	10.65 @ 10.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	18.00 @ 19.00
Lake Superior Car Wheel and Malleable.....	17.75 @ 18.00

Rogers, Brown & Co., Iron furnace agents, have moved into large and commodious quarters in the Carew Building, on the southwest corner of Fifth and Nine streets.

Cleveland.

CLEVELAND, OHIO, May 15, 1893

The market for Iron Ore is extremely dull, although the rush of Ore to the furnaces continues with unabated activity. Over 41,000 tons were sent forward during the past week as compared with 23,000 tons for the same week in 1892. The idea that the purchase of 400,000 tons of Norrie Ore by the Carnegies would precipitate a general buying movement has not been verified. Some Ore has been sold during the past week, but the amounts involved have generally been small. Vessel rates have braced up a bit, 60¢ ℔ ton being now the ruling rate from Escanaba to Ohio ports. From Ashland and Two Harbors, however, the prevailing rate is 95¢ ℔ ton. This is 30¢ below the asking price two months ago and means a great deal to buyers. Never before in the history of the Iron Ore trade have such extraordinary efforts been made to clear the local docks and put them in readiness for the great quantities of Ore to come down a few weeks later on. Furnacemen are approaching the market cautiously and are making offerings that seem reasonable enough and that are not unlikely to be accepted later on. The situation is unique in every way. The concessions from the vesselmen have been greater than was generally expected and active negotiations are now pending for some substantial purchases.

Iron Ore.—It is the general opinion that the price for good Bessemer Ores to be mined this year is fixed very close to $3.75 ℔ ton, lower lake delivery. Certain producers of Gogebic Bessemers still talk of $4 ℔ ton, f.o.b. vessels Cleveland, Fairport or Ashtabula, but these were early season figures, before vessel rates were cut to the minimum figures. "Wild charters" from Ashland are reported to day at 95¢ ℔ ton. Incidentally, sales of non-Bessemer Ores, quite low in Iron, are reported as low as $2.80 ℔ ton, Cleveland delivery. The Illinois Steel Company are daily expected to enter the market, but instead of doing so have sent their ships into commission between the Iron Ore district and Ohio ports.

Pig Iron.—Foundry Irons are weak, and so are Gray Forge Irons. Buyers are waiting patiently the settlement regarding the price of Ore. We hear of a sale of Gray Forge at $12.15, Cleveland, July delivery. Lake Superior Charcoals have declined to $16 @ $16.25.

Scrap.—Dealers report to-day that No. 1 Railroad Wrought can be bought as low as $12 ℔ ton, Cleveland, with Wrought Iron Turnings quoted at $6.50 @ $7, and other quotations unchanged.

Old Rails.—The market is rather dull with $19 @ $19.25 ℔ ton given out as the prevailing quotations for Old American Rails.

Nails.—Local dealers quote Steel Wire Nails at $1.65 and Cut Nails at $1.40 from stock. In carloads the quotations are: Wire Nails, $1.50 ℔ keg; Cut Nails, $1.20 ℔ keg, Cleveland.

Barb Wire.—The demand is heavy and the local mills are being hard pressed to keep up with their orders. Galvanized Wire is quoted at $2.60 and Painted at $2.20 in car load lots. These prices are sometimes altered for big orders.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*, Bank of Commerce Building, St. Louis, May 17, 1893.

Pig Iron.—Local demand for Pig Iron has fallen off somewhat during the past week and sales of the entire week will hardly foot up a respectable day's business. The financial situation is of course having a very perceptible influence on the market, and for this reason we look to see some cheap Irons on the market before long. The market has reached a level, however, where it seems impossible to go lower, and yet well informed furnacemen say lower prices are almost inevitable. Consumption keeps up fairly well and consumers are at present carrying lighter stocks than at any period for some time past. They are husbanding their resources and are not anxious to have their money tied up in Pig Iron just at this time. Gray Forge is to be quoted at $7.75, and No. 2 Foundry at $8.75, f.o.b. cars Birmingham, although brands which are well-known in the trade command 25¢ ℔ ton more than the above prices. We cannot see anything very encouraging in the situation, and the consumers who buy their supplies as their necessities require will more than likely be the most benefited thereby. We quote as follows, for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$13.00 @ $13.50
Southern Coke, No. 2 Foundry	12.00 @ 12.25
Southern Coke, No. 3 Foundry	1100. @ 11 75
Southern Gray Forge	11 25 @ 11 50
Southern Car Wheel	17.75 @ 18.25
Lake Superior Car Wheel	17.00 @ 17.50
Ohio Softeners	16.00 @ 17.00
Missouri Charcoal, No. 1 Foundry	13 00 @ 3.50

Bar Iron.—There is nothing new to report in this department. Mills are not overburdened with work, and are shading prices to secure orders. Complaint is heard concerning the prices made by some of the smaller mills, which, it is stated, are below cost. The outlook is not very encouraging for any early improvement, and the next 30 days will doubtless record a still lower range of values. Mills quote 1.50¢ @ 1.52½¢, f.o.b. cars East St. Louis, according to quantity and specifications.

Barb Wire.—The Wire market does not show any material change. The demand continues to be satisfactory, and prices remain unchanged as last quoted. Painted in carload lots to jobbers $2.15; Galvanized, $2.55.

Wire Nails.—The Wire Nail market is a trifle weaker than last reported, and mills quote from $1.60 to $1.65 for carload lots. Jobbers report a fair trade at $1.70 for the city and $1.75 for country trade.

Pig Lead.—The weakening tendency which made its appearance last week continues to exercise its influence on this metal, and offerings are freely made on the basis of 3.60¢ for delivery over the next two months. This price would be shaded if the order was of a respectable size, and judging from the way the market is acting, 3.50¢ will shortly be the prevailing quotation.

Spelter.—The prediction contained in our last report that Spelter would sell at 4¢ before two weeks had elapsed is more than verified by to day's prices, which were 3.95¢ @ 4¢ for deliveries extending over the balance of the year. There does not seem to be any good reason why Spelter should not sell at 3½¢, as the stocks on hand are very large and are being added to daily; in fact, this metal is being produced in quantities in excess of the consumptive demand. A lower market is naturally inevitable.

Rogers, Brown & Meacham, St. Louis, Mo., have been appointed exclusive agents for the Jenifer Furnace, whose product is a high grade Car Wheel Iron.

A. P. DeCamp & Co., Continental Building, St. Louis, have leased and will shortly move into a suit of rooms in the new Rialto Building.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, May 17, 1893.

A few more failures have taken place in this section in the Iron trade during the past week, but they were neither so numerous nor of as important a character as had been feared. The nervousness shown in the trade here last week has largely disappeared. The first plunge into financial troubles being over, the bearings of the situation are examined with more calmness, and the result is that a considerably easier feeling has developed. The matter is now regarded much more philosophically, and the view is taken that everybody is not going to fail, nor even a very considerable percentage in business. Reasonable caution will be observed in giving credit, but buying and selling must go on and the usual hazard of commercial life will be taken.

Pig Iron.—The condition of trade during the past week was rather discouraging to sellers. Transactions have been light, and few inquiries are now coming forward. It is a fact worth notice, however, that consumption keeps up remarkably well. Shipments are heavy on old contracts and consumers in very few instances are asking to have deliveries deferred. New business will very probably be slow for some time, as both producers and consumers are feeling their way carefully, neither being desirous of anticipating the future to any extent. Prices of Northern Irons have not been affected by the financial situation, as makers are in no hurry to force Iron on the market. Some Southern companies, however, are making strong efforts to push sales, and are offering concessions beyond anything previously known here. It is a good time for buyers who are able to pay prompt cash, as they receive special consideration. The molders' strike in the local foundries is now about over, and the net result is in favor of the employers. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal	$16.50 @ $17.00
Local Coke Foundry, No. 1	13.75 @ 14.25
Local Coke Foundry, No. 2	12.85 @ 13.25
Local Coke Foundry, No. 3	12.35 @ 12.75
Local Scotch	14.00 @ 15.00
Ohio Strong Softeners	16.00 @ 16.50
Southern Silvery, No. 1	@ 15.00
Southern Silvery, No. 2	@ 14 50
Southern Coke, No. 2	13.00 @ 13.35
Southern Coke, No. 3	12.60 @ 12.75
Southern, No. 1, Soft	12.85 @ 13.25
Southern, No. 2, Soft	12.35 @ 12.75
Southern Gray Forge	11.85 @ 12.25
Tennessee Charcoal, No. 1	16.50 @ 17.5
Alabama Car Wheel	@ 13.85
Coke Bessemer	14.50 @ 15.00
Hocking Valley, No. 1	16.75 @ 17.00
Jackson County Silvery	16.75 @ 17.00

Bars.—A considerable difference of opinion is found among sellers. Some report the market extremely dull, with very little inquiry, while others have evidently been more fortunate in finding consumers who desired to cover their requirements for a considerable period. The sales reported cover a number of good sized quantities, and one inquiry is noted for some 6000 tons of material to cover a season's supply. The agricultural implement makers are not coming forward with their usual alacrity this year, but everything in this line will be postponed to a considerably later period than usual. Prices appear to hold up remarkably well under the circumstances. Quotations continue at 1.50¢ @ 1.53¢, Chicago, on base sizes, although large buyers insist that they have been offered Iron at considerably lower rates. This seems curious, however, in the light of persistent inquiry addressed to manufacturers whose prices are steadily held at the foregoing figures. The Soft Steel trade is in fair shape, with prices held at 1.63¢ @ 1.70¢, Chicago, for mill shipment. The recent failures in the Soft Steel trade will probably put this branch in better condition, as those who have failed were the lowest sellers in the markets west of this city. Their failure is alluded to as evidence that Soft Steel could not be made and sold at a profit at the prices obtained. Quotations on small lots from store range from 1.65¢ to 1.75¢ on Bar Iron and 1.75¢ to 1.85¢ on Soft Steel.

Structural Material.—A fair demand for small lots has characterized the business for the past week, but large transactions are waiting. The financial situation is expected to interfere quite seriously with some of the building projects on the board in the Northwest. Mill shipments, Chicago delivery, continue to be quoted as follows: Beams, 1.85¢ @ 1.90¢; Tees, 1.95¢ @ 2 05¢. Small lots from stock sell at 15¢ @ 20¢ ℔ 100 above these prices.

Plates.—Mill and store orders are both very light and dealers are now unusually careful about giving credit. The Boiler trade is exceedingly quiet, and there are plenty of idle boiler makers, which is not a good accompaniment of the recent advance made in their wages. Quotations on mill shipments, Chicago delivery, are as follows: Tank Steel, 1.80¢ @ 1.90¢; Shell Steel, 2.05¢ @ 2.15¢; Flange Steel, 2.20¢ @ 2.30¢; High Grade Fire Box, 3.87½¢. Store prices are as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.20¢ @ 2.40¢; Shell, 2 35¢ @ 2.50¢; Flange Steel, 2 60¢ @ 2.80¢; Boiler Tubes, 67½ % @ 70 %.

Sheets.—The Black Sheet mills report their order books in very good condition, with continued inquiries for carload lots and heavier. The season, however, is almost past for contracts of any size. Quotations on mill shipments of No. 27 Common Iron are maintained at 2.85¢ @ 2 90¢, Chicago, with Steel Sheets 10¢ @ 15¢ ℔ 100 advance. Galvanized Iron is quiet, although some manufacturers seem to be favored with rather fair trade. Mill shipments of Juniata are quoted at 70 and 10 % discount Sheet Copper is in a little better demand, with small lots still selling at 30 and 5 % discount.

Merchant Steel.—Apart from a season contract for about 500 tons of special shapes, business has been light in this line. Open Hearth Machinery is

now a little easier and mill shipments may be quoted at 1.90¢ @ 2.10¢, Chicago, for smooth finished. Spring Steel is steady at 2¢ @ 2 20¢. Buggy or Smooth-Finished Tire is also firm at 2¢ @ 2.10¢. Iron Finished Tire sells at 1.70¢, with Bar-Iron extras. Ordinary Tool Steel is quoted at 6¢ @ 7¢, with Specials at 12¢ upward

Rails and Track Supplies.—In contradistinction to the other branches of trade, Steel Rails are assuming a more encouraging aspect. During the week several inquiries of a very much better character than have lately been current were received and it is expected that they will lead to transactions before the close of the week. The outlook for new business has considerably improved, and much comfort is taken from the circumstance. The efforts made to break prices have not so far succeeded, and manufacturers regard the situation with apparently much confidence. Quotations are continued at $30 @ $32, according to quantity. Iron and Steel Splice Bars are being quoted at 1.65¢ @ 1.70¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.65¢; Spikes, 1.95¢ @ 2.05¢.

Old Rails and Wheels.—Old Iron Rails are quiet, with nominal quotations maintained at $18. Buyers offer considerably less than this, but railroad companies refuse to sell, their managers being under the impression that better prices will be realized eventually. It is difficult to see how they can reconcile their views with the steady depreciation in value of other Old Material. Old Steel Rails are nominally quoted at $10.75 for short pieces and $15 for long lengths, the price of the latter being maintained on account of the necessity of selecting. Old Car Wheels have been sold in small quantities at $14.25, but holders ask $14.50 @ $15 for anything like a quantity.

Scrap.—Some transactions are noted in both high and low grade Scrap, but not of sufficient importance to restore the market to anything like its usual activity. Reports of very low offers continue to be received from the country, but dealers maintain the following selling prices ℔ net ton: No. 1 Forge, $14; No. 1 Mill, $10; Sheet Iron, $6; Pipes and Flues, $9.50; Axles, $21; Horseshoes, $14; Fish Plates, $16; Spikes and Bolts, $13.50; Cast Borings, $5.75; Wrought Turnings, $7.75; Axle Turnings, $9.50; Heavy Cast, $11; Stove Plate, $8.50; Malleable Cast, $9; Mixed Steel, $10 @ $10.25, gross ton; Leaf Steel, $17.75.

Metals.—Copper is unchanged at 11¾¢ for Lake and 10⅝¢ for casting brands in carload lots. Advices from Lake Superior are to the effect that Copper will certainly be forwarded by lake this week, when quotations will be reduced to correspond with the reduction in freight. Spelter has been sold in carload lots at 4.25¢ the past week, but the outlook is in favor of lower prices, although it is difficult to say how much of a reduction is likely to be made.

Park, Bro. & Co. have removed their Chicago branch from 243 Lake street to 50 and 52 South Canal street. In their new quarters they will enjoy about double the room and will also have the advantage of being in the midst of Steel consumers and engineering supply houses. They will be able to store from 1000 to 1500 tons of Tool Steel alone. Their stock of Plates will be carried in the basement, which is well adapted for such a purpose, having a high ceiling and being dry and well lighted. The tracks of the Panhandle Railroad run in the rear of the building, so that stock can be both received and shipped by rail with very little handling.

F. B. Buss & Co., dealers in Iron, Steel and railway equipment, have removed from Room 414 Phenix Building to Room 931 Monadnock Block, corner Jackson and Dearborn streets, Chicago.

The Edwin S. Jackman Company, Rookery Building, Chicago, have been appointed exclusive agents for the sale of Park, Bro. & Co.'s Steel and Copper to railroad companies on and after June 1. The railroad trade will thus be separated from the general trade of Park, Bro. & Co., which will be conducted from 50 and 52 South Canal street. The Edwin S. Jackman Company are composed of men who have made a special study of the qualities and tempers of Tool Steel required in railroad use, and who are also familiar with Locomotive Fire Box Steel, Boiler Plate, and other grades. They will carry in their warehouse a complete stock of all grades and sizes of Steel, as well as a heavy assortment of Sheet and Bar Copper.

Frank C. Lewis will succeed Edwin S. Jackman as manager of Howe, Brown & Co.'s branch house at 55 to 59 North Jefferson street, Chicago. Mr. Lewis has been connected with the house for some time.

The Greenfield Iron & Nail Company of Greenfield, Ind., have appointed W. C. Brown, 45 La Salle street, Chicago, agent for the sale of their Steel Cut Nails.

Boston.

Office of *The Iron Age*, 146 Franklin St., Boston, May 16, 1893.

The feature in the Iron and Steel market this week is the rather firmer feeling in Structural Material. There is no doubt but what the larger manufacturing concerns at Pittsburgh and other points have secured a good many orders, the result of the recent low prices. Later the word comes from some of the largest of them that they are "full of orders" for the present and are asking higher prices. Agents of prominent concerns are reporting this sort of a market, and the same reports are sent here by telegraph. Of course this stronger feeling is only slight at present, but it may develop into a prominent change in the market.

Pig Iron.—The market on Pig Iron is quiet. Agents and dealers mention only a dull trade for a week. This is not because the consumers are not very busy, but it is the result rather of the recent flurry in the stock market and stringency in the money market. Values are not materially changed, however, and quotations on Southern Iron, delivered in Boston, are steady at: No. 1, $15 @ $15.50; No. 2, $14.50 @ $15; No. 3, $13 @ $14. The demand for Virginia Iron is good, comparatively, with the market at $15 @ 15.50 for No. 1, and at $14 for No. 2. These prices are for Virginia Iron landed in Boston. Pennsylvania Iron continues quiet, with the market for Iron at shipping port steady at: No. 1, $14.50 @ $15; No. 2, $13.50 @ $14; Gray Forge, $13 @ 13 50. Western Irons are in quiet demand at $17.50 @ $18 for Iron delivered in Boston.

Bar Iron.—The feature in the Bar-Iron trade is the fact that the Warr mill at Wareham is at last leased for the term of five years. Geo. F. Blake, well and very favorably known in the Iron trade, especially at Worcester, has bought the good-will and stock of the late Mr. Warr, both at the mill and at the Boston store, and has also leased the mill for a term of five years. The mill will start under the new management next Monday. The firm is to be styled Geo. F. Blake & Co. This insures the making of New England Old Material Iron by another concern for a while longer. Bar Iron is steady at: Old Material Bars 1.60¢ @ 1.65¢ from mill; from store, 1.65¢ @ 1.70¢; best Puddled Iron Bars 1.80¢ @ 1.90¢ from mill; from store, 2¢ @ 2¼¢. Norway and Swedish Irons are very quiet, with the market at $64.50 @ $66 ℔ ton for Bars and Shapes. It is reported that the new Iron will be late about getting in, and July 1 is suggested as the earliest for this Iron to arrive.

Building Iron.—The feeling in Building Iron or Steel is a little stronger, as mentioned above; still there have not been any very heavy orders placed during the week. The Boston and Albany Railroad is not only buying Iron freely for cars, as noted last week, but it is also strengthening all of its bridges west of Springfield, in order to safely support the enormous locomotives the road has lately been supplying. The contracts for strengthening these bridges are largely in the hands of the J. B. Hawkins Machine Works of this city. The bridges are requiring from 10 tons to 50 tons of Iron each. Boston builders are very busy on the contracts already placed, though the late financial flurry may have possibly stopped the projecting of a few buildings for a while. In the mean time the new building law and the vigor with which the building inspectors are following up the contractors are requiring heavier and heavier materials, and several contracts for Beams and other Structural Iron have been considerably increased. Quotations are steady to slightly firmer at: Beams and Channels, from mill, 1.90¢ @ 2¢; from store, 2.30¢ @ 2¼¢; Tees, 2.20¢ @ 2.30¢, from mill; from store, 2.40¢ @ 2 65¢; Angles, 1.90¢ @ 2¢ from mill; from store, 2.20¢ @ 2.45¢.

Steel, Steel Plates and Steel Rails.—The demand for Merchant Steel continues good. Machinists are busy, and manufacturers note a good trade, and both are consumers of Steel. But the easy position of Billets has caused an easy feeling to continue in finished Steel. The Northern and Eastern railroads are not buying Rails freely, though there is some demand for Rails for electric roads. It is believed that Steel Plates are about as low as they are to go for the present, and the mills are not so badly in want of orders as they were, having secured orders on the recent decline in prices. Steel is quoted at: Bessemer Steel, 2¢ @ 2.10¢; Tire and Sleigh Shoe, 1.95¢ @ 2¢; Sheet, 2¼¢ @ 2¼¢; American Cast, 6¾¢ @ 7¼¢; English Cast, 14¢ @ 15¢; American Steel Rails, $39, at mill. Steel Plates are quoted at: Tank, 1.85¢ @ 1.90¢; Shell, 1.95¢ @ 2¢; Refined, 2.10¢ @ 2.15¢; Flange, 2.15¢ @ 2¼¢; Fire Box, 2¼¢ @ 2¾¢.

Nails.—Nails continue in very fair demand, with the market steady, and with Cut Nails, both Iron and Steel, quoted at $1.50 @ $1.60 ℔ keg for small lots, and at $1.45 @ $1.50 for car lots. Wire Nails are steady at $1.70 @ $1.75 ℔ keg to the trade here.

Pipe and Tubes.—There is a very fair trade in Pipe. Water works orders are a feature of the market, and there is considerable competition for them, though prices are not being cut as they would be were prices not firm with manufacturers. Boiler Tubes hold firm at 60 % @ 65 % off from list on all sizes.

Scrap Iron.—The market on Scrap Iron is looking rather better, especially since it is now assured that the Warr mill is to run, as mentioned above. This mill uses low grade Scrap largely, having furnaces adapted to puddling and working it. No. 1 Wrought is quiet at 52½¢ @ 55¢ for common selections, with best selections, including Old Horseshoes, at 60¢ @ 65¢. Light Scrap is a little better held at 35¢ @ 40¢, with Machine Shop Scrap at 25¢ @ 30¢ for Cast and at 30¢ @ 35¢ for Wrought.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, May 16, 1893.

On Tuesday, June 6, the Amalgamated Association of Iron and Steel Workers will meet here for the purpose of formulating a wage scale for 1893–94, and, as is well known, the situation in labor circles is considerably mixed, principally on account of a rival organization known as the National Union of Finishers. This new body is composed of skilled labor only, being made up of heaters, roughers, rollers and catchers, and a wage scale has been prepared based on rates now in force. As to the scale that will be agreed upon by the Amalgamated Association nothing definite can be said at this time, but it is the impression that the scale now operative will not be materially changed, and it is absolutely certain that no advances will be asked. On the other hand, nothing can be said definitely as to what the manufacturers propose to do. No concerted action has yet been taken, and may not be until the new scale has been presented to the employers by the workmen. However, it has been intimated that a number of the largest makers of Finished Material in this vicinity, who are at considerable disadvantage with concerns employing non union labor, have decided that unless they are offered rates that will put them more nearly on a par with their competitors they will endeavor to operate their plants independent of the Amalgamated Association. The uncertainty surrounding the settlement of the wage scale has commenced to affect the market in the direction of causing a firmer tendency in prices. From this time until June 30 mills generally will be operated up to full capacity in order to be as well prepared as possible for a period of idleness. Under these conditions orders will be refused that otherwise would probably be accepted, and accumulation of stock will be the object of all concerns for the next six weeks. During the week under review prices were about stationary, with tendencies to better figures on some lines for reasons noted above.

Ferromanganese.—There is no improvement in demand, with prices somewhat weaker. We quote at $58 @ $58.50, f.o.b. cars Pittsburgh.

Plates.—While trade continues quiet, a moderate tonnage is coming in, and, in view of possible labor complications, it is believed that buyers will anticipate their wants to some extent from this time forward. It is the impression, too, that prices are probably as low as they will go, and that when a change comes it will be in the nature of better values. We quote as follows: Tank, 1.60¢ @ 1.70¢; Shell, 1.80¢ @ 1.90¢; Flange, 1.90¢ @ 2¢; Ordinary Fire Box, 2.25¢ @ 2.50¢; Special, 3.25¢ @ 3.50¢.

Steel Rails.—Business continues to be confined to small lots. Demand so far this year has been disappointing, but it may pick up later on. Prices continue on the basis of $29 at mill for standard sections. It is stated that on light sections extremely low prices are being made.

Structural Material.—Early in the year makers looked forward to a busy period when the building season opened up, and while it is true that there has been a fair demand right along, it is also true that business has not come up to expectations by a good deal. The stringency in the money market has seriously retarded building operations, and for this reason the construction of many projected buildings will go over till next year. Prices continue low, and with the severe competition for business better prices cannot be expected. We quote as follows: Beams and Channels in ordinary lots, 1.65¢ @ 1.70¢; Angles and Universal Plates, 1.60¢ @ 1 70¢; Z Bars, 1.75¢ @ 1.85¢; Tees, 1.80¢ @ 1.90¢.

Wire Rods.—An inquiry for 2000 tons for early shipment is in the market and will probably be closed this week. We continue to quote at $30, f.o.b. cars at mill. This price would probably be shaded for round lots.

Muck Bars.—In view of the anticipated greater activity in the operations of mills between now and July 1, it is not improbable that the demand for Muck Bars will pick up to some extent. We continue to quote at $24, delivered at buyer's mill, for best grades. Reports are going that some sales of Muck Bars have been made on the basis of $23.85, Pittsburgh.

Pipes and Tubes.—A meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held in the Monongahela House, Pittsburgh, on Thursday, the 11th inst. The attendance was large and reports from those present indicated that the Pipe and Tube trade is in better condition at this time, both as regards demand and prices, than for some months. A good many of the mills have about all they can do, and the outlook for the future is given as being exceedingly bright. The only change made in discounts was on Butt Welded Black Pipe, which was changed from 60 % to 57½ % from manufacturers' list. Discounts on other sizes and kinds remain as follows: Butt-Weld Galvanized, 50 %; Lap-Weld Black, 67½ %; Lap-Weld Galvanized, 57½ %. On Boiler Tubes discounts are as follows: 2¼ inch and smaller, 65 %; 3-inch and larger, 67½ %. The Pittsburgh office of the American Tube & Iron Company secured a contract recently for about three carloads of Line Pipe for shipment to the Durango Iron & Steel Company, at Durango, Mexico.

Wire and Cut Nails.—The situation in the Wire-Nail trade is not as satisfactory just now as it has been. The demand has fallen off very largely, while prices have been adversely affected. At this time there is considerable pressure on the part of the mills to dispose of product and as a consequence buyers are being offered slight concessions on prices. However, the heavy buying for the year has been done and new business coming in will consist principally of small lots. We continue to quote on the basis of $1.50, Pittsburgh or Cleveland, in carload lots, with the probability that this price would be shaded on round lots. In Cut Nails there is a fair demand going, with prices unchanged on the basis of $1.15 in carload lots, f.o.b. at mill.

Bars.—Mills here and in the Mahoning Valley are taking on greater activity, partly on account of increased inquiries, but mainly because it is desirable to increase stocks as much as possible, in view of the possible shutdown about July 1, on account of labor troubles. From now on customers will not be favored with as low prices, as many concerns will prefer to run on stock rather than dispose of their product at figures that would be accepted under other conditions. Already prices have taken on a firmer tendency, and mills in the Mahoning Valley are holding out for 1.45¢ at mill, half extras, and it must be a good order and a regular customer before 1.42½¢ will be accepted. In Pittsburgh Steel Bars are held at 1.50¢ @ 1.55¢ and Refined Iron Bars at 1.60¢, half extras.

Sheets.—Pittsburgh makers of Iron and Steel Sheets, as well as those in the Ohio Valley district, are well sold up and are not inclined to book very largely of new business in anticipation that they may be confronted with labor troubles when the wage scale comes up for settlement. The possibility of a shutdown has stimulated business to a considerable extent and orders are coming in freely and nearly all for prompt shipment. Prices are very firm, with tendency to higher values. In giving quotations named below, it should be stated that some mills would probably decline to book orders at quoted prices, and we understand some mills are already asking advances on prices given below. We quote Common Sheets as follows: No. 24, 2.50¢ @ 2.60¢; No. 26, 2.65¢ @ 2.70¢; No. 27, 2.75¢ @ 2.80¢. On Soft Steel Sheets an advance of from $1 to $2 ₱ ton on above prices is charged. The demand for Galvanized Sheets is also very heavy, one concern in this city having stated that their product is fully sold up for the next two months. Prices are very firm and we quote Best Bloom at 70 and 5 %, with a possibility that 70 and 10 % would be done on desirable business.

Wire.—The condition of the Wire market is without change. Mills continue to be operated full time, and while less complaint is heard regarding tardy shipments, it will be some time yet before old orders have been cleaned up. The present season has certainly been a satisfactory one for Wire makers, as far as demand is concerned, and prices have also been fairly satisfactory. We continue to quote Painted Barb Wire at $2.10 and Galvanized at $2.50, in carload lots, with slight concessions offered to large buyers. Plain Wire is in good demand, and at unchanged prices, as follows: Nos. 6 to 9, 1.70¢; Nos. 10 and 11, 1.80¢ @ 2¢.

Connellsville Coke.—Shipments of Connellsville Coke for the month of April were considerably less than for March. The April output is given at 548,078 tons, as against 641,876 tons in March. There is no improvement in demand and it is probable that additional ovens will be blown out in a short time. We continue to quote Furnace Coke at $1.60 @ $1.70 in tons of 2000 lb, f.o.b. cars in Connellsville region,

with the first named as the basis of actual transactions. Foundry Coke is held at $2.15 to dealers and $2.30 to consumers.

(*By Telegraph, May 17, 1 p.m.*)

Bessemer Pig.—Within the past week Bessemer Pig has scored a clean advance of 25¢ ℔ ton, and it is doubtful if it could be bought to-day on the basis of $13.50, Pittsburgh. Within the past two weeks the largest producer of Pig Iron in this district has solicited prices for Bessemer Pig from furnaces in the Pittsburgh district and also in the Mahoning Valley, and in quantities ranging from 2000 to 3000 tons from each furnace, with deliveries extending from June to September. Up to this time these inquiries have resulted in purchases amounting to about 20,000 tons at prices ranging from $13.40 to $13.60, Pittsburgh. It is probable that pending negotiations for further purchases will be closed this week. The entrance of this concern into the market as a buyer is the principal cause of the advance noted above; and in addition, the fact that furnaces both here and in the Mahoning Valley were already sold up to some extent has also had its effect. As to whether the advanced prices can be maintained opinions differ, but when it is considered that stocks are light, with the output of a number of furnaces disposed of for some time, it would seem there should not be any immediate return to lower prices. An additional reason in favor of the better prices on Bessemer being maintained for a time at least is found in the fact that from now until July 1 there will be greater activity among makers of finished products in view of possible labor troubles. A slightly better inquiry for Foundry Irons is reported, with prices firmer, but unchanged. Gray Forge is in light demand and $12.25, Pittsburgh, has been shaded in some recent transactions. We quote as follows:

Neutral Gray Forge	$12.15 @	$12.25,	cash.
A l-Ore Mill	12.50 @	.....	"
No. 1 Foundry	13.75 @	14.00,	"
No. 2 Foundry	12.75 @	13.00,	"
Charcoal Foundry No. 1	17.00 @	18.00,	"
Charcoal Foundry No. 2	16.50 @	17.00,	"
Bessemer Pig	13.50 @	13.65,	"

We are advised of a number of transactions in Bessemer Pig aggregating close to 20,000 tons at prices ranging from $13.35 to $13.50, Pittsburgh. Also 2000 tons for May and June, at $13.50, Pittsburgh, and a reported sale of 3000 tons for June, July and August at $13 at valley furnace, equal to $13.65, Pittsburgh.

Billets.—Like the Bessemer Pig market, Steel has also improved during the past week, and sales of Billets for May and June delivery have been made within the past few days at an advance of about 50¢ ℔ ton over lowest prices quoted in our report of last week. Even should the wage scale be arranged without trouble on July 1, it is likely that two or three mills here and some in the Wheeling district will close down about July 1 for repairs that must be made, and this will take considerable Steel out of the market. Buyers, knowing this, are anticipating their wants to a considerable extent, with the result that prices have been forced upward. One maker of Billets in this district is reported as having bought close to 5000 tons lately, their output not being sufficient to meet their requirements. Within the past week Steel has sold up to $21.75, Pittsburgh, for next three months' delivery, and an offer of $21.50 at maker's mill has been declined. Pittsburgh makers have not much Steel to spare between now and July 1, and unless they can get their own prices are disposed to hold it. The same is true of Wheeling district, and the opinion prevails that still higher prices for Steel will be reached before July.

Freights.

From Pittsburgh, Beaver Falls, Homestead, Rankin, Braddock and McKeesport to	Group 1.	Group 2.
Albany, N. Y.	$2.40	$2.70
Boston, Mass.	2.80	3.10
New York City, N. Y.	2.40	2.70
Philadelphia, Pa	2.00	2.30
Syracuse, N. Y.	2.00	2.20

Rates shown under head of Group 1 will apply on Pig Iron, Mill Cinder and Scale, per gross ton, in carloads of 12 gross tons and over.

Rates shown under head of Group 2 will apply on Billets (Iron or Steel), Blooms (Iron or Steel), Borings (Iron or Steel), Chain Irons (in coils), Crop Ends (Iron or Steel), Ingots (Iron or Steel), Muck or Puddle Bars, Old Car Wheels and Axles, Old Rails, Scrap Iron, Scrap Steel, Scrap Tin, Slabs, unfinished (Iron or Steel), and Wire Rods (in coils), per gross ton, and on Ingot Molds and Cast-Iron Pipe per net ton, in carloads of 12 tons, net or gross, and over.

Freight rates from Pittsburgh and points in Pittsburgh territory to points named below on the different classes and also on articles of Iron and Steel manufacture are as follows:

	Classes. Rates in cents per 100 pounds.						*Articles of Iron and Steel.	
	1	2	3	4	5	6	L. C. L.	C. L.
Rochest'r, N.Y.	32	27	21	14½	12	11	12	11
Syracuse, N.Y.	35	30	23	17	14	12½	14	12½
Utica, N. Y.	39	33	24½	18½	16	13	16	13
Oswego, N. Y.	39	33	28	19	16	13	16	13
Albany, N. Y.	45	39	30	21	18	15	18	15
New York City, N. Y.	45	39	30	21	18	15	18	15
Boston, Mass.	50	43	33	24	20½	17	20½	17
Portland, Me.	50	43	33	24	20½	17	20½	17
Burlington, Vt	60	52	40½	29	24½	19½	20½	17
St. Paul	82	67	55	37	31	25	31	25
Duluth	75	62	50	36	29	25	24	20½
Detroit	31	28	20	14	13	11	...	...
Chicago	42½	37½	27½	20	17½	15	...	...

*Rates on articles of Iron and Steel will expire at close of business September 30, 1893, unless sooner revoked or superseded.

Intelligence was received in Pittsburgh this week to the effect that the Supreme Court at Philadelphia had confirmed the decision of the lower court in the case of James P. Witherow, engineer and contractor, of Pittsburgh, against the Sheffield Furnace Company of Sheffield, Ala. This claim of Mr. Witherow is for work done for the above concern, and his claim with interest now amounts to between $90,000 and $100,000.

Forsyth, Hyde & Co., Pig Iron brokers, with main offices at Chicago, have opened a branch office in Room 712 Lewis Block, Pittsburgh, Pa., in charge of W. H. Goff.

Louisville.

LOUISVILLE, KY., May 15, 1893

There has been no change in the price of Iron, values being as low as possible. Consumers, however, are buying only from hand to mouth, as they do not feel it wise to contract for a large tonnage ahead, in view of the uncertainty of the money market. So far there have been very few failures among Iron factors in the West, and owing to the fact of Iron having been upon such a low basis for the last year or two business has been conducted without any speculative features attached to it, and it is felt that the position of Iron consumers is comparatively strong. Owing to the low prices for furnace products, there is no effort made to keep more furnaces in blast than are sufficient to supply current wants, and several plants have gone out of blast and will not enter as competitors for Iron business until there is a very marked improvement in prices. With the closing down of several furnaces, with no chance of their starting for a long time, the indications are very strong that before long an improvement in price will be manifest, arising from the fact that the furnaces now in blast will not be sufficient to supply the tonnage wanted, if there is no decided check to the present volume of business; so it would be wise on the part of consumers to purchase freely for long deliveries where they can get orders booked for Iron suitable for their use. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry	$12.75 @	$13.25
Southern Coke, No. 2 Foundry	11.50 @	12.00
Southern Coke, No. 3 Foundry	11.00 @	11.25
Southern Coke, Gray Forge	10.50 @	10.75
Southern Charcoal, No. 1 Foundry	15.00 @	16.00
Southern Car Wheel	17.50 @	17.75
Spathite	11.50 @	12.50

Financial.

Compared with one week ago Wall street is tranquil, but one course of disturbance succeeds another, and after an unusual number of failures, mostly among banking concerns in the West doing business on a fictitious capital, the collapse of speculation in Australia becomes more ominous and threatening, because creating new demands for gold in London and compelling the sale of American securities held as an investment. Thus the prospect that gold might come from Europe seems more remote and the advance that has already taken place in sterling rates indicates the probability of further shipments thither in considerable amounts. Thus, too, nervousness on account of the disastrous turn in Australian affairs characterizes the markets in London, and New York is not altogether exempt. Including four Australian banks whose suspensions have been announced this week, no less than thirteen institutions are involved within less than four months, and from the published statements it would appear that their aggre-

gate liabilities must exceed $400,000,000, rivaling the tremendous collapse in Argentine, which was felt the world over. Distrust of the ability of the Australian banks to meet their obligations caused a withdrawal of deposits, with consequences that will not at once be apparent. A survey of the monetary situation must include the impending crisis in India, growing out of the depreciation of the silver rupee, and which mercantile correspondents on the spot regard with apprehension. Another matter discussed in commercial circles is the constitutionality of the Geary Chinese exclusion law, as affirmed by the United States Supreme Court, which may send our tea trade to England and our petroleum trade to Russia.

As results of the recently announced suspension of the Chemical Bank at Chicago, two other National banks closed their doors—viz, the Columbian Bank of Chicago, with $1,000,000 capital and $1,700,000 deposits, and the Capitol Bank of Indianapolis, Ind., with $300,000 capital and $1,400,000 deposits. The Comptroller is advised that the first-mentioned will resume. The Columbian directors announce that they will resume, and United States Examiner Young at Indianapolis has no doubt the Capitol will resume. Bank Examiner Sturges says of the bank situation in Chicago: "I will stake my reputation that there is no other failure here among the national institutions." Respecting the National Cordage Company the receivers show a large excess of assets, and a plan of reorganization is being considered. Altogether, the Western situation is supposed to be much improved. The United States Treasurer again finds that the $100,000,000 gold reserve is intact.

Stocks have had a turbulent week, railroad stocks of acknowledged merit having suffered in the general decline, several touching a lower point than for many years. Even London, in the face of these declines, has been selling stocks recently bought, and the disposition to sell will probably be more pronounced since the failure of the Commercial Banking Company of Sydney and the Queensland National Bank, both being large concerns. On Saturday liquidation was the feature, owing to Western bank troubles and news from abroad, and on Monday the tone was unsettled and weak. In the Vanderbilts there were sharp fluctuations. United States bonds were firm and unchanged. The loan market was fairly active and easy, in spite of the expected shipment of a large amount of gold the latter part of this week. In time loans there was no important change. On the choicest lines accommodation was to be had at 5½ % for periods under four months. For other dates 6 % was quoted. Commercial paper was inactive and freely offered. The bank statement showed a gain of $5,183,400 in cash and $4,959,850 in surplus reserve, making the latter $17,795,025.

New York.

Office of *The Iron Age*, 96-102 Reade street,
NEW YORK, May 17, 1893.

Pig Iron.—There have been some inquiries for round lots in the market, both for Anthracite and for Charcoal Pig, a consumer of the latter asking for a considerable quantity. While the supply of Foundry grades from the Lehigh Valley is taken care of quite well, as much cannot be said of Gray Forge, which is feeling the decline in the consumption of the puddling mills quite severely. There are indications of weakness, too, among some of the Alabama furnaces, while in isolated cases Virginia furnaces are holding out for an advance of 25¢ on the lowest prices made. We quote Northern brands at $14 50 @ $15.25 for No. 1; $13 75 @ $14.50 for No. 2; $12.25 @ $12.50 for Gray Forge, tidewater. Southern Iron, same delivery, $14 @ $14 50 for No. 1; $12.75 @ $13.50 for No. 2, and $13 @ $13.50 for No. 1 Soft; $11.75 @ $12.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—The market is dull with very little inquiry. Quotations remain nominally as follows: $22 @ $22.50 for 10 % and $25 @ $25.50 for 20 % Spiegeleisen, and $57 @ $57.50 for foreign 80 % Ferromanganese.

Billets and Rods.—No business is reported and the market is very dull. We quote, nominally, domestic Billets, tidewater, $23.75 @ $24.25; foreign, nominally, $29 @ $29.25; domestic Wire Rods, $33 @ $34; foreign Wire Rods, $40 @ $40.50, and Swedish Rods, $52 @ $53.

Steel Rails.—Business continues very dull, so far as the Eastern mills are concerned, the largest order taken during the week having been 3500 tons. The order for 5000 tons for an Eastern road, with an option on 10,000 tons additional, concerning which there was some talk lately, was in reality closed about a month since. Eastern mills are complaining of the sharp competition in and the low prices made on Light Sections by Western mills. During the first four months reported sales by the associated works aggregated 600,000 tons, while shipments were about 325,000 tons, so that there were on hand about two months' work at the present rate of running. Since the opening of the month, however, the Western works have captured some good orders, there having been placed in the Chicago market about 60,000 tons, which includes 20,000 tons for the "Soo," 10,000 tons for the Pecos Valley, 15,000 tons additional for the C., B. & Q., and some small orders, including an increase in the Wabash order. The outlook for the Eastern mills for the second half of the year is exceedingly blue, since there are very few orders in prospect in their territory. Quotations remain unchanged.

Track Material.—Spikes are quoted at 1.85¢ @ 1.95¢; Fish Plates at 1.50¢ @ 1.60¢; Track Bolts, square nuts, at 2.4¢ @ 2.50¢, and hexagon nuts at 2.5¢ @ 2.60¢, delivered.

Manufactured Iron and Steel.—The contracts for the Park Avenue Elevated work have not yet been signed, it being understood that there is some difference in the figuring on weights between the engineers and the bidders. It is expected, however, that the matter will be closed at an early date and that then the contracts for the materials will be given out. The addition to the Produce Exchange has been placed. Figuring is going on on a large hotel and on some other structures. Competition continues exceedingly keen, and prices made are exceptionally low in nearly every line. We quote: Beams up to 15-inch, 1.80¢ @ 2.10¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.80¢ @ 1.90¢; Tees, 1.85¢ @ 2¢; Channels, 1.85¢ @ 2¢, on dock. Steel Plates are 1.80¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.25¢ @ 2.50¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.60¢ @ 1.9¢, on dock, and Common 1.50¢ @ 1.60¢. Soft Steel Bars are 1.50¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.80¢ @ 1.90¢, delivered; Cotton Ties, 80¢ @ 85¢ ℔ bundle, at mill.

Old Material.—We quote: Old Iron Rails, $16.25 @ $16 50, on cars Jersey City, and Old Wheels, $12.75 @ $13.

Hugh W. Adams & Co., Pig Iron merchants, have removed from 56 Pine street to the Vanderbilt Building, 15 Beekman street.

Metal Market.

Pig Tin.—The weight of heavy supplies here, together with unfavorable advices from Europe, has caused a further sharp decline in prices. On Monday, when the pressure was greatest, Straits was offered at as low as 19 60¢ net cash on the spot, while sales were made of May and June delivery at the same price, showing a decline for the week of over ½¢ ℔ lb and about 1½¢ from the extreme highest point reached when the McKinley "bull" fever was highest. Considerable Tin has changed hands at the decline, but there have been no signs of financial trouble among operators, although quite heavy losses are easily figured out. Toward the close of the week there was a decided reaction and better general feeling, with circumstantial evidence that the "bull" interest have regained control, temporarily at least. On Tuesday there were transactions involving about 350 tons, with a jump in prices to 19.70¢ net cash for spot, and 19½¢ for May, 19.90¢ for June, and 20¢ for July delivery, Wednesday's market, July delivery, selling at 20.10¢, while 19.95¢ seemed to have been strictly inside rate for June and 19.85¢ for May. The arrivals here during the first half of the month amounted to no less than 2250 tons, since which time 380 tons have been landed. There are afloat over 900 tons, making a considerable addition to the visible supply for this market. Straits shipments during the fortnight were also heavy, amounting to 1050 tons, against 925 tons recorded for the corresponding period last year and 2200 tons in the month of April. As a whole, the statistical position would indicate that the proposed duty has been well discounted by speculators and that the near future of the market depends in a great measure upon the staying qualities of the largest holders here of Tin afloat for this country.

Copper.—There was quite free offering from first hands early in the week of Lake Superior Ingot at 11¢, Electrolytic at 10⅜¢ @ 10½¢, and Common Casting at 10⅛¢ @ 10¼¢. In speculative circles there have been offers of Lake product at 10.85¢ @ 10.90¢ for July and later delivery. It is understood also that sales of Casting Copper have been made at prices below the popular quotations. During the greater portion of the week business was slow, with transactions involving lots of more than 25,000 lb strictly the exception. A freer movement has taken place the past few days, however, particularly in Lake Ingot, including at least 500,000 lb at 11¢, with a shade more paid in remote instances for some deliveries.

The monthly production of Copper in the United States since July has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal lake, Montana and Arizona producers; the

second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.

1892.	Reporting mines. Gross tons.	Outside sources. Gross tons.	Total. Gross tons
July.....	9,294	924	10,218
August...	10,807	870	11,677
September.	9,710	994	10,704
October....	9,668	1,289	10,957
November.	9,888	1,036	10,924
December..	9,872	1,174	11,046
Total, six months..	59,239	6,287	65,526
1893.			
January...	9,187	989	10,176
February..	8,213	1,042	9,245
March.....	9,065	1,321	10,386
April.....	11,775	1,042	12,817

The product of the foreign reporting mines was as follows:

Foreign Reporting Mines.

1892.	Gross tons.
July..	6,358
August	6,888
September	5,478
October	6,476
November	6,789
December	7,666
Total six months	39,655
1893.	
January	5,736
February	6,762
March	6,896
April	6,913

The exports of fine Copper from the United States were as follows:

United States Exports.

1892.	Gross tons.
July	3,450
August	1,545
September	1,458
October	3,144
November	3,897
December	4,486
Total six months	17,980
1893.	
January	3,171
February	1,815
March	2,334
April	3,450

Pig Lead.—Sales have been made of about 300 tons Common Domestic at 3.80¢ for near future delivery and rumor had it that as low as 3¾¢ was touched in at least one instance. The weakness is due chiefly to somewhat lengthy period of comparative inaction on the part of large consumers and accumulation of supply in first hands that, with the stringency in the money market, has forced sales to some extent. At the close the market was 3¾¢ bid, 3.85¢ asked.

Spelter.—Prices for Western have suffered a further decline and the market is at present in a depressed condition, suffering from heavy production and indifferent buying on the part of most consumers. Some few sales of carload lots for early shipment were made at from 4⅛¢ down to 4.30¢, but round lots were subsequently offered at 4¼¢ for shipment up to and including September, and rumor had it that that price would have been accepted for some brands for deliveries running through to the end of the year.

Antimony.—Dealings have been moderate and the market is rather easy, without, however, any radical change in prices. Current quotations are 10¢ for Hallett's, 10¼¢ @ 10½¢ for L.X., and 10½¢ @ 10¾¢ for Cookson's.

Tin Plate.—There has been no improvement in the demand for Plates for either prompt or future delivery, and the movement at present is largely deliveries on old contracts. Arrivals have been quite heavy, affording good supply and assortment, but there is no sign of burdensome holdings, and prices remain fairly steady except for Wasters, which are offered lower. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., $5.50; Bessemer full weight, $5.50; light weights, $5.10 @ $5.12½ for 100 lb, $5 for 95 lb, $4.90 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75; IX basis, $6.85. Charcoals—Melyn grade, IC, $6.50; Crosses, $8; Allaway grade, IC, $5.70; Crosses, $6.90; Grange grade, IC, $5.80; Crosses, $7. Charcoal Ternes—Worcester, 14 x 20, $5.70; do., 20 x 28, $11.35; M. F., 14 x 20, $7.25; do., 20 x 28, $14.50; Dean grade, 14 x 20, $5.35 @ $5.37½; do., 20 x 28, $10.50 @ $10.70; D. R. D. grade, 14 x 20, $5.; do., 20 x 28, $10.30; Wasters—S. T. P. grade, 14 x 20, $4.87½; do., 20 x 28, $9.25; Abercarne grade, 14 x 20, $4.87½; do., 20 x 28, $9.20.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, May 17, 1893.

Scotch Iron warrants have dropped to 40/2½. Cleveland have remained at about 33/7½, and Hematites varied but slightly from 44/7½ @ 44/9. Stocks in public stores have changed to the extent of a few hundred tons only. There is almost entire absence of outside speculation, owing to financial disturbances and dearer money, consumers also deferring purchases owing to general dullness of trade, and prices continue soft for most brands of Scotch, Cleveland and Hematite Iron. The latter is freely offered at 46/ f.o.b. Rails are quiet at about £3. 15/ f.o.b. for heavy sections, and Billets, Rods, &c., remain very quiet.

The Pig Tin market has been weak and depressed. Prices for prompts dropped from £92. 2/6 to £89. 15/, and three months' futures from £87. 10/ to £85. 7/6. The decline is attributed in a good measure to absence of support from New York and financial disturbances. Operators have been very slow about venturing in futures, owing to general uncertainty. During the last few days the market recovered sharply, in good part under the influence of covering of "short" accounts. Straits sold up to £90. 10/ @ £90. 12/6 for prompt delivery, and £85. 15/ @ £86. for three months' futures.

Merchant Copper for prompt delivery has been sold during the week at as low as £42. 18/9, which price shows a decline for the week of about £1. 2/6. The depression was due in good part to realizations by tired holders and selling orders from America, together with general financial weakness. There was heavy selling Monday, owing to reports of further bank suspensions. Stocks have decreased 1605 tons, and the visible supply 1805 tons during the past fortnight. At the close the market was steady, with Merchant Bars quoted at £43 for prompts, and £43. 12/6 for futures, and Best Selected English at £48.

The market for Tin Plate has been inactive, and prices are still easy, yet without positive change. Shipments have been heavy, however, and reduced stocks at shipping ports during the week about 17,000 boxes or to 229,000 boxes. In the Liverpool market prices rule as follows:

IC Charcoal, Alloway grade	13/3 @ 13/9
IC Bessemer Steel, Coke finish	12/0 @ 12/3
IC Siemens " " "	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20	12/0 @ ....
Charcoal Terne, Dean grade	13/6 @ 14/

Pig Lead has been in moderate demand, and the market is still easy, with £9. 10/ @ £9. 12/6 quoted for Soft Spanish.

Spelter is still offered very freely, and the market continues weak, with sellers at £17. 10/ for ordinary Silesian.

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HARDWARE.

Condition of Trade.

THE CONDITION OF BUSINESS is about as at our last report, with a good deal of unevenness, some manufacturers reporting an excellent demand and being behind their orders, while others refer frankly to the falling off in trade. It will also be seen that in the reports given below from Chicago, St. Louis and other Hardware centers reference is made by some of our correspondents to the fact that business is on the whole in a very satisfactory condition, and goods moving with at least fair freedom, while others call attention to the continued dullness, which in large measure is attributed to the prevalence of bad weather. The uncertainty in regard to money matters is undoubtedly an important factor in the situation, as merchants and manufacturers see the wisdom of pursuing a very conservative course, assuming only the obligations which they are sure to be able to meet and scrutinizing credits very carefully. This, of course, curtails the volume of business and is doubtless a prudent course to pursue. There have been during the past few weeks comparatively few changes in the prices of Hardware, but the market is not characterized by quite so firm a tone as a few weeks ago, as some of the staple lines which have recently been held quite firmly and at somewhat higher prices than have recently been prevailing are now showing a tendency to weaken. There is also more of a disposition on the part of manufacturers of some kinds of Shelf Hardware to shade prices with a view to inducing orders.

St. Louis.

(By Telegraph.)

We continue to report a dull trade in Hardware, which is due largely to the very unseasonable weather at present prevailing. The financial situation is such that business is generally affected thereby. Jobbers are complaining, and state that for the last six weeks trade has been disappointing in the extreme. Prices of nearly all lines show a weakening tendency. The country trade is suffering from impassable roads, and some jobbers state it does not pay to keep men on the road. There does not appear to be any cessation in the demand for Screen Wire Cloth, and prices continue at $1.75 to $2, according to the size of stock the seller has on hand. Collections are in a ragged condition, and it requires considerable prodding to get money.

Chicago.

(By Telegraph.)

The dullness noted last week continues, but jobbers are taking the situation more philosophically and are not endeavoring to force trade. Bleak weather has again prevailed throughout this section, checking the demand for summer goods. Wire Cloth seems to have reached its climax at $1.75, with the supply now apparently ample to meet the demand. Poultry Netting is also in fair stock, and prices are stationary. Heavy Hardware is in reasonably fair demand, but trade in that line is by no means active. The rough weather has given the carriage trade a setback, which affects the demand for a wide range of goods.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade conditions continue fully up to our previous reports. There is no diminution of orders and all jobbing houses are fairly busy.

All jobbing houses, however, are suffering from the delay in manufacturers filling orders upon season's goods. Especially does this continue on Green Wire Cloth, and we regret to say it is not likely that there will be any possibility of manufacturers catching up for the next two months to come. This is causing considerable dissatisfaction with customers throughout the country, who hardly realize that we are at the mercy of the manufacturer, and daily orders cannot be received with the promise of shipment at an early date. They are beyond the ability of the jobbers to execute. The stock in hand of jobbers has been completely exhausted, so there is no possibility of depending upon each other in order to complete shipments.

The situation would not be helped in the least if an advance of ½ cent a foot were to take place, because it is simply impossible for the Cloth manufacturers to make shipments as fast as the demand requires.

Scarcity also exists in Poultry Netting, not, however, to the same extent.

Lawn Mowers have also been sold beyond stocks on hand, and shipments now on leading Lawn Mowers (especially the Pennsylvania, Continental, and Quaker City) depend upon the daily output.

If the interior merchants will not anticipate their wants on leading season goods, present conditions must also continue to a greater or lesser extent each season.

Collections are not up to the usual standard.

Cleveland.

THE W. BINGHAM COMPANY.—The present financial condition, together with the backwardness of the spring, has not tended to improve the volume of business. Trade in this section of the country, while from all reports not as bad as in some other localities, is nothing to brag of. There is still a great scarcity of Screen Wire Cloth, and the advanced prices are being strictly maintained. Wire Nails and Wire of all kinds are not as firm as they have lately been, and the demand has fallen off somewhat. Shelf Hardware, particularly such as enters into buildings, is in good demand. Refrigerators, Ice Cream Freezers and other summer goods are now commencing to move. Prices generally are being well maintained, and there is a conservatism shown by most of the dealers that augurs well for the prompt payment of bills in the future. Collections are dull.

New Orleans.

A. BALDWIN & CO.—Business is becoming very quiet in this section, which is certainly not improved any by the usual scare caused each year by the condition of the river. Owing to the local improvements, the builders' line shows fair activity. Seasonable goods are moving freely, but there is no special feature in any line deserving of any particular notice. Heavy rains recently in Texas have improved that locality somewhat, although it is having the opposite effect in Louisiana and Mississippi, giving them much more water than they can take care of.

Boston.

BIGELOW & DOWSE.—Fine weather for the past two weeks has had a beneficial influence, and for all kinds of Hardware there is a brisk demand. Nearly every one wants Wire Cloth and there is none to be had. None of the jobbers have any stock, but are booking orders at $1.60, and are not making promises as to time of delivery. Many manufacturers of Screens and Doors are unable to make deliveries on account of the shortage of Wire Cloth. This condition of affairs is very annoying now and it bids fair to be worse later in the season. There is a large demand for Poultry Netting, but jobbers' stocks are well assorted and orders are filled promptly. There is a good demand for Lawn Mowers, but on the cheaper grades there is a short supply of some of the favorite makes. The sale for Scythe and Haying Tools is just commencing. There is more inquiry for Nails and the lower prices now ruling are stimulating orders for both Wire and Steel cut. There is a fair demand for Cordage, but at lower prices than have been ruling. Stocks

of Cutlery are large and well assorted. The styles are very attractive, and the many new devices being adopted to assist the retailer in showing his goods add materially to his sales. The large sale of Bicycles still continues, and while some of the dealers' stocks are better assorted, the sale bids fair to continue well into August. There is nothing discouraging in the trade outlook. Remittances are better this month and compare very favorably with last year.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Trade in all lines is moving along quietly. The volume is about the same as last season, perhaps a little less in the aggregate, but not much difference. Prices are cut as little as we have ever known. Credits are most carefully scrutinized and jobbers are not so anxious or even willing to sell goods as they have been at some times in the past. It requires money to replace the goods in stock, and in the face of a tight money market it is more desirable to hold the goods rather than to sell them on long and uncertain time. From the necessities of the case business will be very conservative this season. At the same time the prospects of the final outcome of the year in the Northwest are very good and have seldom or never been better at this season than now.

The bulk of small grain has been sown and the weather could scarcely be more favorable than it now is. A remarkable amount of rain and snow has fallen since last October, and the ground as well as lakes, ponds and creeks are full of moisture, which with us is a very favorable condition. Upon the whole the situation is promising.

Baltimore.

CARLIN & FULTON.—Business is in possibly its normal condition, neither better nor worse than at the corresponding time of last year. In some lines, such as Wire Cloth, Screen Doors and Windows, Poultry Netting, and all products of Wire the demand this year has been extraordinary.

The unfortunate burning of one of the largest factories manufacturing Ice Cream Freezers will probably result in a scarcity of them should the season be anything like that of last year, and we advise all buyers to place their orders promptly and not be caught at the hight of the season with an advanced market, as has been the case with Wire Cloth.

Remittances are generally good, showing that the excitement and shrinkage in values in stocks have not yet materially affected the mercantile interests of the country where they have been conducted upon a conservative basis; but every one knows that a continued depression and lack of confidence in the great financial centers of the country will ultimately not fail to have a corresponding effect upon all, and it is to be hoped that wise legislation will at an early date provide some method of settling the vexed question as to our currency which will allow all business to continue and expand without fear of financial trouble or a panic precipitated by stock jobbing speculators.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—Weather eccentricities still continue to prove a disturbing factor in business; unseasonable weather is always detrimental to trade, let it come when it will. The present season turned warm early and there was every promise of an early spring, but the continuance of cold and wet weather has failed to stimulate the demand for spring goods to the extent that was anticipated. Farmers have been persistently at work whenever they could get a chance, and although they have been only partially successful, confidence has not been shaken by the delay. There is still a large percentage of last year's crop in the hands of the producers, which will be marketed as soon as opportunity affords. Taking everything into consideration jobbing business may be reported as fair and fully as good as could be expected.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—Trade is holding up remarkably well considering the disadvantages under which this section of the country has been working for the past four months. Low prices for our produce, tight money, unseasonable weather, bad roads and reaction from booming times, are enough to break the back of most any country. However, the "silver lining" we hope is that the business, when it arrives, will be on a better basis than it has ever been.

The credit system has been the curse of this Northwest country, and we doubt if there is any place where it has been worked harder than here.

We have an anomaly in trade this spring in Painted Wire Cloth, having shipped same 15,000 miles and selling it at $1.50, when the price is reported $1.75 in Eastern jobbing centers.

Prices continue to seek a lower level, and, owing to our advantage of Cape Horn shipments, we are better able to hold our own against Eastern competition than for a long time past.

Louisville.

W. B. BELKNAP & CO.—Amid the wreck of matter and the crash of small financial worlds throughout Indiana, Michigan and Iowa, to say nothing of lesser disturbances elsewhere, it is consoling and gratifying to note that the course of general business keeps on in its own great way. It is singular how slight has been the effect on the business of the country at large of the slump on the New York Stock Exchange and the numerous bank failures. Money is uncomfortably tight, to be sure, and we opine that most loans which were actually callable were called, and that without many preliminaries. But, notwithstanding the squeeze, provisions have varied but trifling amounts, and iron scarcely at all. Indeed the safety in the situation lies, as we have had occasion to say before in the fact that values were firmer. There is no inflation in the great manufactured staples.

Continued wet, cold weather has retarded farm work and reduced the sale of summer supplies for the time being, but a few days of sunshine, which are sure to come soon, will no doubt change all that.

Notes on Prices.

Cut Nails —There is a moderate demand for Cut Nails and prices show but little change since our last report. The market is not characterized by a strong tone, but there has been no further open yielding in price, the quotation in the East being on the basis of $1.10 for carload lots at mill. This price, however, is sometimes slightly shaded. Small lots from store in New York are held at $1.35 to $1.40.

Chicago, by Telegraph.—The trade in Steel Cut Nails shows no new developments and manufacturers are quoting $1.30 to $1.35 Chicago for factory lots and are booking some orders, but not of any magnitude. The season drags along very discouragingly and the distribution from second hands is considerably below the average. Jobbers are selling small lots from stock at $1.35 to $1.40.

Wire Nails —The quotation for Wire Nails remains $1.50 for carload lots at mill, but the market is not strong and intimations are made that this figure has been slightly shaded. Manufacturers complain that orders are coming in slowly, inasmuch as their large customers are still well supplied and those who are likely to want Nails in the near future prefer to wait for the developments of the market. While the manufacturers are congratulating themselves that the production of Wire Nails durthe past year, as shown in the statistics which were published in our last issue, exceeded that of Cut Nails, they would prefer to have the present demand more vigorous and well sustained.

Chicago, by Telegraph —Wire Nails are very quiet. So little business is now being done that it is hard to tell what prices are ruling in the market. Manufacturers' quotations are ruling generally at $1.55 Chicago, although a few of them would shade this price if there were any orders in sight which could possibly be secured. The heavy buyers seem to be well stocked, and are turning a deaf ear to inducements. Small lots from stock are selling from $1.70 to $1.75 to country trade and $1.65 to city buyers.

Barb Wire —There is little to say in regard to Barb Wire. The demand is sluggish and prices are steady. We quote $2.45 to $2.50 for Four Point Galvanized in carload lots at mill. Small lots delivered in New York are quoted

at $2.70 for Galvanized and $2.30 for Painted.

Chicago, by Telegraph.—Manufacturers report no improvement in their trade. It is one dead level of moderate business which comes in with aggravating slowness. Quotations are unchanged at $2.20 for factory lots of Painted and $2.60 for Galvanized. Small lots from stock are selling at $2.30 to $2.70, respectively.

Chains. — The manufacturers of Wagon and Fancy Chains have for some time been conferring with reference to a revision of the lists in order to make them represent more closely the present cost of the goods. The changes made are principally in the lists of the following goods: Stage Traces, with clip; Breast Chain, Running or Back Cart Chain, South Jersey Traces, Breech Chain, Tug Chain, Heel or New York Traces, Well Chain, and Rein Chain. The list given below is that of the Nes Chain Mfg. Company, York, Pa., for whom Surpless, Dunn & Alder, 97 Chambers street, New York, are agents, and the changes in list are marked by asterisks:

Long Traces.

Bright or Black—Straight Links.

American size. Feet.		English size. Feet.		Per pair.
6½	6, 4	6½	8, 3	$0.65
6½	8, 4	6½	10, 3	.74
6½	10, 4	6½	12, 3	.82
6½	12, 4	6½	14, 3	.95
6½	14, 4	6½	16, 3	1.05
6½	5, 3	6½	6, 2	.69
6½	6, 3	6½	8, 2	.72
6½	8, 3	6½	10, 2	.82
6½	10, 3	6½	12, 2	.92
6½	12, 3	6½	14, 2	1.05
6½	14, 3	6½	16, 2	1.20
6½	16, 3	6½	18, 2	1.35
6½	18, 3	6½	20, 2	1.35
6½	6, 2	6½	8, 1	.82
6½	8, 2	6½	10, 1	.93
6½	10, 2	6½	12, 1	1.03
6½	12, 2	6½	14, 1	1.20
6½	14, 2	6½	16, 1	1.40
6½	16, 2	6½	18, 1	1.65
7	6, 4	7	8, 3	.72
7	8, 4	7	10, 3	.80
7	10, 4	7	12, 3	.90
7	12, 4	7	14, 3	1.05
7	14, 4	7	16, 3	1.15
7	16, 4	7	18, 3	1.30
7	6, 3	7	8, 2	.78
7	8, 3	7	10, 2	.90
7	10, 3	7	12, 2	1.00
7	12, 3	7	14, 2	1.15
7	14, 3	7	16, 2	1.35
7	16, 3	7	18, 2	1.50
7	18, 3	7	20, 2	1.90
7	6, 2	7	8, 1	.90
7	8, 2	7	10, 1	1.05
7	10, 2	7	12, 1	1.23
7	12, 2	7	14, 1	1.30
7	14, 2	7	16, 1	1.55
7	16, 2	7	18, 1	1.80
7	8, 1	7	10, 0	1.30
7	10, 1	7	12, 0	1.45
7	12, 1	7	14, 0	1.75

T-Bar, Hooks, or T-Hooks 2 cents net per pair extra.

In ordering say if English or American sizes are wanted.

* Traces with five end Links 3 cents net per pair extra.

Long Traces.

Bright or Black—Twist Links.

American size. Feet.		English size. Feet.		Per pair.
6½	6, 4	6½	8, 3	$0.70
6½	8, 4	6½	10, 3	.79
6½	10, 4	6½	12, 3	.88
6½	12, 4	6½	14, 3	1.02
6½	14, 4	6½	16, 3	1.12
6½	6, 3	6½	8, 2	.77
6½	8, 3	6½	10, 2	.87
6½	10, 3	6½	12, 2	.98
6½	12, 3	6½	14, 2	1.12
6½	14, 3	6½	16, 2	1.28
6½	16, 3	6½	18, 2	1.43
6½	18, 3	6½	20, 2	1.75
6½	6, 2	6½	8, 1	.88
6½	8, 2	6½	10, 1	.99
6½	10, 2	6½	12, 1	1.10
6½	12, 2	6½	14, 1	1.27
6½	14, 2	6½	16, 1	1.48
6½	16, 2	6½	18, 1	1.75
7	6, 4	7	8, 3	.77
7	8, 4	7	10, 3	.85
7	10, 4	7	12, 3	.96
7	12, 4	7	14, 3	1.12
7	14, 4	7	16, 3	1.22
7	16, 4	7	18, 3	1.40
7	6, 3	7	8, 2	.84
7	8, 3	7	10, 2	.96
7	10, 3	7	12, 2	1.07
7	12, 3	7	14, 2	1.22
7	14, 3	7	16, 2	1.43
7	16, 3	7	18, 2	1.58
7	18, 3	7	20, 2	2.00
7	6, 2	7	8, 1	.96
7	8, 2	7	10, 1	1.11
7	10, 2	7	12, 1	1.30
7	12, 2	7	14, 1	1.38
7	14, 2	7	16, 1	1.64
7	16, 2	7	18, 1	1.90
7	8, 1	7	10, 0	1 37
7	10, 1	7	12, 0	1.53
7	12, 1	7	14, 0	1.85

T-Bar, Hooks, or T-Hooks, 2 cents net per pair extra.

In ordering, say if English or American sizes are wanted.

Traces with five end links, 3 cents net per pair extra.

Stake Chain.

With Large Ring, Swivel and Hook.

American size. Feet.		English size. Feet.		Per pair.
* 6½	8, 4	6½	10, 3	$0.93
* 6½	10, 4	6½	12, 3	.98
* 6½	8, 3	6½	10, 2	1.00
* 6½	10, 3	6½	12, 2	1 12

Twist, 2 cents net per pair extra.

Half Traces or Butt Chain.

With Ring—Straight Links. American size.

Links.	12 in.	18 in.	24 in.	30 in.	36 in.	42 in.
8	4.. $0.19	$0.24	$0.33	$0.39	$0.44	$0.51
10	4.. .21	.26	.35	.41	.49	.57
12	4.. .25	.30	.37	.44	.52	.60
14	4.. .27	.32	.39	.49	.57	.66
16	4.. .32	.28	.43	.52	.62	.72
18	4.. .37	.44	.53	.59	.71	.84
8	3.. .23	.28	.35	.42	.50	.58
10	3.. .25	.30	.37	.44	.53	.62
12	3.. .27	.32	.39	.48	.57	.68
14	3.. .34	.40	.45	.55	.65	.78
16	3.. .38	.44	.52	.59	.71	.84
18	3.. .45	.52	.60	.69	.85	1 01
8	2.. .27	.32	.39	.47	.55	.64
10	2.. .31	.36	.43	.50	.60	.68
12	2.. .33	.40	.47	.54	.65	.76
14	2.. .39	.47	.56	.61	.75	.86
16	2.. .48	.52	.60	.67	.80	.96

Twisted, 1 cent net per pair extra.

T-Bar, 2 cents net per pair extra.

Hooks, or T-Hooks, 2 cents net per pair extra.

Stiff Traces.

Black—Straight Link.

American size.	Per pair.
6½ feet, 22, 3	$2.75
7 " 22, 3	3.00
36 inches, 22, 3	1.35
42 " 22, 3	1.50

Stage Traces With Clip.

Bright or Black.

Plain T-Bar on 16 and 18 links American Size, Hook T Bars on others.

American size. Feet.		English size. Feet.		Per pair.
*2	14, 3	2	16, 2	$0 80
*2	14, 2	2	16, 1	.87
3	10, 4	3	12, 3	.66
3	12, 4	3	14, 3	.71
*3	14, 4	3	16, 3	.85
*4	16, 4	3	18, 3	1 00
*3	18, 4	3	20, 3	1.15
3	8, 3	3	10, 2	.68
3	10, 3	3	12, 2	.74
3	12, 3	3	14, 2	.79
*3	14, 3	3	16, 2	.95
*3	16, 3	3	18, 2	1.05
*3	18, 3	3	20, 2	1.25
3	8, 2	3	10, 1	.73
3	10, 2	3	12, 1	.79
*3	12, 2	3	14, 1	.84
*3	14, 2	3	16, 1	1.10
*3	16, 2	3	18, 1	1.25
*3½	14, 4	3½	16, 3	.95
*3½	16, 4	3½	18, 3	1.10
*3½	18, 4	3½	20, 3	1.30
3½	8, 3	3½	10, 2	.75
3½	10, 3	3½	12, 2	.82
3½	12, 3	3½	14, 2	.88
*3½	14, 3	3½	16, 2	1.05
*3½	16, 3	3½	18, 2	1.15
*3½	18, 3	3½	20, 2	1 40
3½	8, 2	3½	10, 1	.82
*3½	10, 2	3½	12, 1	.90
3½	12, 2	3½	14, 1	.97
*3½	14, 2	3½	16, 1	1.25
*3½	16, 2	3½	18, 1	1.45

* With Snap Clip and Ring, 35 cents list per pair extra.

* With Snap, 10 cents list per pair extra.

Wagon Chain.

Any length or style required.

	Per lb. ¼ in.	5-16 in.	⅜ in.
Stay	$0.15	$0.13	$0.12½
Tongue	.15	.13	.12½
Lock	.16	.14	.13½
Stretcher	.17	.15	.14½
Fifth	.17	.15	.14½

Breast Chains—Penn'a Pattern.

Bright or Black, with T-Bar.

	Per pair.
26-inch, 5-16-inch iron, double twist, heavy taper at the end, stiff	$1.00
26-inch ¼-inch iron, double twist, light taper at the end, stiff	1.00
26-inch, 5-16-inch iron, single twist, stiff	1.00
26-inch, ⅜-inch " "	1.00

Breast Chain.

With T-Bar.

American size. Inch.		English size. Inch.		Per pair.
24	10, 3	24	12, 2	$0.47
26	10, 3	26	12, 2	.50
27	10, 3	27	12, 2	.53
30	10, 3	30	12, 2	.56
24	10, 2	24	12, 1	.53
26	10, 2	26	12, 1	.54
27	10, 2	27	12, 1	.55
30	10, 2	30	12, 1	.60
27	9, 4			.43
27	8, 3	27-inch, 10, 2		.45
27	9, 3			.46
27	9, 2			.52
27	9, 5-16			.71
28	9, 5-16			.75
30	9, 5 6			.82
*24	tapered 5 16 to ¼			.60
*27	tapered 5-16 to ¼			.65
*34	tapered 5-16 to ¼			.80
27	double slack twist			.80
30	double slack twist			.85
27	10, 3 Malleable Slide			60

* Snaps one end, 20 cents list per pair extra.

Cow Ties

Open and Shut Ring Patterns with T-Bar.

Feet.	Nos.	Shut Ring. Per doz.	Open Ring. Per doz.
3	6	$3.10	$3.60
3½	6	3 33	3.90
4	6	3.68	4.20
4½	6	3.91	4.64
3	5	3 44	3.77
3½	5	3.63	4.02
4	5	3.98	4.45
4½	5	4.39	4.95
3	4	3.52	3.83
3½	4	3.74	4.20
4	4	4.01	4.51
4½	4	4.41	5.00
4	3	4.45	4.96
*4½	3	4 85	5.32

Snaps, 20 cents per dozen net extra.

Ohio Pattern.

Nos.		4½ ft.	5 ft.	5½ ft
1.	Wire, per doz	$5.25	$5 75	$6.25
2.	" "	4.85	5.40	5.82
3.	" "	4.56	4.80	5.20
4.	" "	4.14	4.30	4.75
5.	" "	3.85	4.03	....
6.	" "	3.60	3.78	....

Snaps, 20 cents net per dozen extra.

Halter Chains.

Sheffer's Pattern 4½ feet Long—Black with two T-Bars.

	Per doz.
3-16 Iron Twisted No. 1, Short Links	$5.50
3-16 " Straight No. 1, "	5.45
3-16 " Twisted No. 2, Long	4.25
No. 4 Wire, Short Links	5.75
No. 4 " Long "	4.80

Ox and Log Chain.

Long Link—Bright or Black—Hook and Ring.

Inch.	Per round.
¼	$0.15
5-16	.13
⅜	.12
7-16	.11½
½	.11
⅝	.10

Log Chain.

Short Link with Grab Hook.

Inch.	Per pound.
¼	$0.17
5-16	.14½
⅜	.13½
7-16	.13
½	.12
⅝	.11½

Running or Back Cart Chain.

Bright or Black.

Feet.	Inch.		Per dozen. 1 Swivel.	2 Swivels.
*4	¼	Double Twist	$9.84	$11.16
*4	5-16	single "	8.28	9.12
*4½	¼	Double "	11.28	12.36
*4½	5-16	Single "	8.88	9 96
*4	2	" "	7.80	8.52
*4½	2	" "	8.40	9.00
*4½	⅜	" "	12.00	13.20
*4½	5-16	Double "	18.00	19.20
*4	5-16	" "	15 00	16.20

South Jersey Traces.

Plain Twisted Chain with two Hooks—Clips and Ring Extra.

Inch.		Per pair.
*42	12 x 3	$0.88
*42	12 x 4	.80

* With Clip and Ring 8 cents net per pair extra.

Breeching Chain.

Large Clip, Ring, Long Rings, Bright or Black.

	Per pair.
*Made of No. 3 Wire	$0.75
* " " 5-16 "	1.00
*1⅜ inch straight links, with bolt, 2, 2½ and 3 inch, No. 3 Iron	.40
*1⅜ inch straight links, with bolt, 2, 2½ and 3 inch, No. 2 Iron	.50

Tug Chain.

American size. Inches.		English size. Inches.		Per pair.
*18	8, 3	18	10, 2	$0.23
*18	10, 3	18	12, 2	.26
*18	8, 2	18	10, 1	.26
*18	10, 2	18	12, 1	.28
*18	10, 1	18	12, 0	.38
*16	10, 1	16	12, 0	.37
*16	8, 1	16	10, 0	.35
*18	10, 5-16			.40

Chin Chains.

Bright or Black.

	Per doz.
Double Twist, No. 9 Wire	$1.00
Single " " 6 "	1.30

Carrying Chain.

Bright or Black.

	Each.
Double Twist, 3-16 inch Iron	$2.00
Single " " " "	1.25

Line Chains.

Bright or Black.

	Per pair.
Single Twist, 3-16 inch Wire	$0.30

Heel or New York Traces.

With Clip or Swivel D and Hook.

Inch.	No. 3 Iron. Per pair.	No. 2 Iron. Per pair.
*12	$0.44	$0.49
*18	.53	.57
*24	.60	.65
*30	.67	.73
*36	.74	.81
*42	.81	.89
*12, straight links, with D without Hooks	.33	.35
*12, straight links, with clip, without Hook	.37	.41

Well Chain.

With Ring, S-Hook and Swivel.

American size. Inch.		English size. Inch.		Each.
*30	6, 4	30	8, 3	$0.19
*36	6, 4	36	8, 3	.21
*30	8, 4	30	10, 3	.22
*36	8, 4	36	10, 3	.26
*30	6, 3	30	8, 2	.22
*36	6, 3	36	8, 2	.24
*30	8, 3	30	10, 2	.25
*36	8, 3	36	10, 2	.29
*30	6, 2	30	8, 1	.27
*36	6, 2	36	8, 1	.30
*30	8, 2	30	10, 1	.31
*36	8, 2	36	10, 1	.34

Rein Chain.

Inch.		Per foot.
*12	13, 9	$0.27
*18	13, 9	.34
*24	13, 9	.41
*30	13, 9	.48
*36	13, 9	.55
*42	13, 9	.62
*48	13, 9	.69

Wagon Chains. Close Link.

Black, or Self Color.

		Per pair.
Tongue	2¼ feet, ⅜ iron	$1.75
"	3 " 11-32 iron	1.50
"	34 inch, 5-16 "	1.32
Stay	2⅛ feet, ⅜ "	1.15
"	2⅛ " 5-16 "	1.00

Fifth Chains.

Black, or Self Color.

	Each.
⅜ Iron, Close Link, Straight	$4.12
5-16 " " " "	3.85
⅜ " " " Twisted	4.40
5-16 " " " "	4.12

Spreader Chain.

With Three Hooks. Black, or Self Color.

⅜-inch Iron, Close Links Straight, for 2 Horse	$1.65
5-16-inch Iron, Close Links Straight, for 1 Horse	1.50
5-16-inch Iron, Double Twist, for 2 Horse	2.00

Jockey Stick Chain.

	Per doz. pair.
Single Twist, 3-16 Iron	$3.00

The Abell Coffee Pot.—The Leach Roaster & Baker Company, Paxton, Ill., are manufacturing this article, which was described a week or two ago. These Pots are made in two sizes, No. 1, listed at $1, and No. 2, at $1.25. The discount to the trade from these prices is 50 per cent.

Little Giant Traveling Lawn Sprinkler.—The Portland Lawn Sprinkler Company, 32 Oliver street, Boston, are manufacturing this appliance, a description of which was given in a recent issue. It is sold to the trade at $15, subject to a discount of 40 per cent.

Climax Rail and Sheaves.—The Climax Rail and Sheaves, illustrated in this issue, are manufactured by the Climax Rail Company, for whom Crane & Halpin, 62 Reade street, New York, are agents. The goods are sold at a discount of 10 per cent. from the following list:

No. 1 Rail, per foot	$0.60
No. 2 " "	.80
No. 3 " "	1.20
5-inch Anti-Friction Sheaves, per pair	1.50
6-inch " " "	2.00
4-inch Hatfield " "	1.50
5-inch " " "	2.00

Combined Scissors and Tracing Wheel.—This article was described in our last issue. It is put on the market by Pauls Bros., 88 Chambers street, New York, who are selling it to the trade at the following prices:

7	6½	6	5½	5	4½	4	inch.
$5	$4.60	$4.20	$3.90	$3.60	$3.40	$3.20	per doz.

Tinners' Tools.—The following discounts apply to some of the goods of the Niagara Stamping & Tool Company, Buffalo, N. Y., which are shown in their tinners' catalogue, new edition, which is referred to in another column:

Niagara Hollow Punches	20 and 2 %
" Solid "	55 %
" Shears and Snips	20 and 10 %

Indurated Fiber Water Bucket—Cordley & Hayes, 172 Duane street, New York, who are putting this article on the market, are selling it to the trade at $24 per dozen, subject to a discount of 25 per cent. The Water Bucket was illustrated in our last issue.

Cordage.—The Cordage market has developed no new features of importance during the past week, and quotations remain as before. The tone of the market is, perhaps, a shade stronger for the time being at least, inasmuch as most of the manufacturers connected with the National Cordage Company are not in the market. There, seems however, to be no difficulty in obtaining all the Rope needed from outside concerns.

Iron Rivets.—The Iron Rivet market continues in substantially the same irregular and demoralized condition which has characterized it for some time. The manufacturers, however, have been conferring with a view to reaching some understanding in regard to prices, but thus far there has been no change in the situation.

Sifters, Fly Traps, &c.—The principal manufacturers of Sifters, Fly Traps and Corn Poppers have formed the Union Wire Goods Company, having their principal office at Cincinnati, their object being to regulate the prices of these goods and to sell the product of the principal makers. The arrangement is made, we are advised, in the interest of jobbers as well as manufacturers and with a view to establishing prices to the retail trade as well as to the jobbers, for whom a satisfactory margin is thus secured if prices are maintained. The makers of the various brands of the Sifters, Fly Traps and Corn Poppers will take orders as usual, but the billing and collection of the goods is done through the central office of the Union Wire Goods Company, which is in the Masonic Temple, Cincinnati. In the arrangement which has been established the Genuine Hunter Sifter, made by the Fred. J. Meyers Mfg. Company, is quoted at $1.75 per dozen, other Sifters being quoted at $1.50 per dozen. The Harper, Paragon or Champion Fly Traps are quoted at $1.75 per dozen, and the Balloon, Globe or Acme at $1.50 per dozen. The following are the prices on Corn Poppers:

	Per dozen.
Square 1-quart	$1.00
Round 1-quart	1.00
1½-quart	1.25
2-quart	1.50
4-quart	4.00
Double Reversible	1.75

On all of the above goods gross prices have been determined upon, allowing the jobber a fair margin of profit.

Mallory's Standard Shutter Worker.—The following is the price-list on Mallory's Standard Shutter Worker, put on the market by the Mallory Mfg. Co., Flemington, N. J., a reference to which appears on another page:

	Frame house.	Brick house.
Japanned, per pair	$1.25	$1.50
Nickel Plate, "	1.50	1.75
Brass, "	1.75	2.00
Bronze, "	2 25	2.50

This list is subject to the discounts which are printed below:

Bronze.

	Discount.
100 sets or more	35 %
25 sets to 100	33⅓ %
Less than 25 sets	30 %

Brass.

100 sets or more	35 %
50 sets to 100	33⅓ %
20 sets to 50	30 %
Less than 20 sets	25 %

Nickel.

100 sets or more	33⅓ %
20 sets to 100	30 %
Less than 20 sets	25 %

Japanned.

100 sets or more	33⅓ %
50 sets to 100	30 %
25 sets to 50	25 %
Less than 25 sets	20 %

Poultry Netting.—There is a good demand for Poultry Netting and prices are well maintained, but while the market has a good tone there has been no general advance. We are advised by the Gilbert & Bennett Mfg. Company

that reports have been circulated extensively that Poultry Netting manufacturers are behind their orders and asking higher prices, and stating that so far as they are concerned such reports are without foundation. They have filled their orders promptly and have sufficient stock to meet any ordinary demand for regular sizes.

Baxter Wrought-Iron Hay Racks.—The Baxter Wrought-Iron Hay Racks, to which reference is made in another column, are being introduced by Robert Frank Haig, general agent, P. O. Box 307, Newark, N. J. They are sold at a discount of 30 and 10 per cent. in lots of less than 25 racks; 30 and 10 and 10 per cent. discount in larger quantities from the following list:

No. 1 Corner Rack, each	$2.00
" 2 Center Rack, "	3.00

National Time Register.—The National Time Register Company, Columbus, Ohio, are manufacturing this article, which was described in our last issue. The price of one Register suitable to register 50 persons is $50. Where two are purchased by the same firm or company, a discount of 10 per cent. is given, and on three or more purchased by the same concern a discount of 20 per cent. is allowed.

Glass.—There has been little, if any, change in the condition of the Glass market during the past week. Factories report a perceptible improvement in demand, but local dealers are doing comparatively little business. It is understood that at the last meeting of the National Window Glass Company, held at Chicago, the matter of adopting a new long list was discussed, but that probably no action will be taken until toward the end of the season. There seems to be no reason why an amicable agreement on scale matters should not be reached with the operators for the next fire, which goes in blast usually about September 1. It is reported that the Executive Committee of the National Window Glass Company, held another meeting at Philadelphia last week, because this is looked upon as the weakest spot in the country at present in living up to fixed quotations, and as about the only point at which any great shading of prices is being done. The imported Glass market shows lack of activity, and consequently a disposition in prices to weaken. While it cannot be said that Glass is regularly sold at less than printed quotations, there is reason to suppose that large cash buyers are favored somewhat. It is reported that orders for American Plate Glass are coming in satisfactorily and that quotations are sustained. A Pittsburgh paper states that the National Plate Glass Company have purchased the plant of the Charleroi Plate Glass Company, for which they paid $1,750,000, and that this is the fourth plant secured by this company, the others being the works at Crystal City, Ellwood and Kokomo. Prices are quoted unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

World's Fair Notes.

THE BETTENDORF HOLLOW-STEEL AXLE WORKS of Davenport, Iowa, have an exhibit of their patent Axles, Bolsters and Sand Bars in the Transportation Building at the World's Fair. The exhibit is among the Farm Wagons in the northwest corner of the building. The improvement is shown with wheels and other portions of the running gear complete, and attracts much attention.

THE GILBERT & BENNETT MFG. COMPANY of Georgetown, Conn., New York City and Chicago, are well represented at the World's Fair. In the Manufactures Building they have an exhibit which includes Gold, Silver, Brass, Copper, Galvanized and Pearl Wire Cloth (over 100 kinds), Galvanized Netting, Wire Fencing, Gates, ornamental Wire Work, Screens, sample of first Netting made in America by power machinery, which has been exposed over 25 years in the open air, also Woven Fencing used equally as long, house furnishing Wire Goods, and a large variety of articles made of Wire. They have another in the Horticultural Building, where they show a Wire Summer House, patent Knockdown Flower Stands, Chairs, Settees, Flower Trellises, Vine Trainers, ornamental Fences, Gates, Tree Guards, Flower and Lawn Guards, &c. At the Terminal Railway Station can be seen about 3 miles of Woven Fencing made by the Gilbert & Bennett Mfg. Company, used to inclose and divide the railroads; also, 8 acres of "G & B" Netting was purchased by the World's Columbian Exposition to suspend under the glass roofs in various buildings to prevent glass from falling that accidentally might become dislodged. About June 1 they will have ready an artistic publication giving a history of their works, with fine illustrations of methods of manufacture, &c., which will be distributed free as a souvenir commemorative not only of the World's Fair, but also of their seventy-fifth year as manufacturers.

THE IOWA FARMING TOOL COMPANY, Fort Madison, Iowa, send an engraved invitation, which reads as follows:

THE IOWA FARMING TOOL CO.
MANUFACTURERS,
FORT MADISON, IOWA, U. S. A.
AT HOME
From May 1st until October 31st, 1893.
MANUFACTURES AND LIBERAL ARTS BUILDING.
WORLD'S COLUMBIAN EXPOSITION,
CHICAGO, ILL., U. S. A.
Near N.E. corner of the Building.

NIAGARA STAMPING & TOOL COMPANY, Buffalo, N. Y., are sending invitations to the trade inviting them to inspect their exhibit of Machines and Tools for sheet metal workers at the World's Fair. The exhibit is located at Machinery Hall annex, Section 28. The company issue an 1893 edition of their Tinners' catalogue of 56 pages, containing illustrations, descriptions and prices of Tools and Machines for working sheet metal. In compiling this catalogue it has been the aim to present the line of Machinery in a compact form, the various machines having been associated so as to facilitate the comparison one with another of Tools of similar nature.

Baxter Wrought-Iron Hay Racks.

ROBERT FRANK HAIG, P. O. Box 307, Newark, N. J., is sole agent for George L. Baxter & Brother, who are making a specialty of Baxter Wrought-Iron Corner and Center Hay Racks. The frame work of these Racks is made of 1 x ¼ inch heavy wrought iron, and the rods are ½ inch in diameter, firmly riveted to frame. The advance in cost of wrought-iron racks over the cast-iron article is referred to as having made the wrought-iron rack somewhat of a luxury, but that these now being introduced are nearly as cheap as the cast-iron ones. For the prices at which they are sold see Notes on Prices. The point is made that when their lightness and greater durability are taken into consideration they will prove cheaper. Mr. Haig is general agent for the United States and Canada, from whom prices, circulars and information may be obtained. A stock of these Racks is carried by the Eastern agents, Woolley, Baynon & Moore Company, 89 Reade street, New York.

The Ideal Mfg. Company.

JOHN H. BARLOW, the proprietor and manager of the above company, was born in England, April 20, 1846, and came to the United States when two years of age, his father locating in Cohoes, N. Y. Mr. Barlow served three years in the late war, after which he engaged with the Parker Gun Company of Meriden, Conn., as a machinist. Soon after he obtained employment with the Winchester Repeating Arms Company of New Haven as a tool maker, which position he held but a short time, the company selecting him to take charge of the tools and fixtures then in preparation to fill a very large Turkish contract for ammunition. Mr. Barlow continued in the company's employ until July, 1884, a period of 13 years, when he went into business for himself, starting at that time what is now the Ideal Mfg. Company of New Haven, Conn. His long experience in this line has particularly fitted Mr. Barlow for the work of designing and manufacturing reloading tools for Rifles, Pistols, Shot Guns, &c. The company have an exhibit at the Columbian Exposition, which is located in the Manufactures Building, Section Q, Block 3, an inspection of which will doubtless repay those interested in arms and ammunition.

KARST & BREHER, St. Paul, Minn., have issued an enterprising advertising circular, entitled, "St. Paul, 7 Corners, as It Is, 1893." The first page is devoted to their spring announcement, followed by illustrations and descriptions of Furnaces, Gasoline Stoves, Refrigerators, Lawn Mowers, Ranges, &c. The book also contains a list and location of fire boxes, and a business directory of the Seven Corners.

Trade Items.

THE W. S. TYLER WIRE WORKS COMPANY, Cleveland, Ohio, in their page advertisement in this issue call the attention of the trade to their Tyler Poultry Netting, which is described as made from No. 19½ wire before galvanizing, and heavy coated with pure spelter after being twisted. The company claim that thus the joints are thoroughly soldered and the entire netting made rust proof.

JAMES PENDER & Co., St. John, N. B., in a circular to the trade, warn dealers against buying and selling wire nails which are an infringement on their Bull Dog Steel Wire Nails. The Bull Dog Nails are treated by a patented process, to increase their resistance when being drawn.

AMONG THE SPECIAL NOTICES in this issue is one calling attention to an auction sale of the bankrupt stock of the Florence Tack Company, at Northampton, Mass., where the plant is located. The sale is announced to take place on Wednesday, May 31, and will include Tacks and Nails of all sizes, kinds and description, Flat and Round Wire, Staples of all kinds, Plate Iron, Wire of all kinds, Castings, Wire Rods, Tool Steel and Wrought-Iron Bars, besides Machinery, Tools, &c.

TOWER & LYON, 95 Chambers street, New York, issue a neat hanger relating to Tower's Engineers' Wrench (Donahue's patent). Illustrations are given of the Wrench with pipe cutter, with long sleeve nut and with short nut.

THE PARTNERSHIP heretofore existing between C. W. Mueller and A. C. Witte, under the firm name and style of Mueller & Witte, Aberdeen, S. D., has been dissolved by mutual consent. A. C. Witte has purchased the interest of Mr. Mueller and will continue the business alone.

ON THURSDAY of this week the New York State Jobbers' Association will meet at Elmira, N. Y.

ON MAY 8, a fire in the building adjoining the New York office of Carlin & Fulton, Baltimore, at 708 Broadway, damaged their samples and compelled them to change their quarters. The office is now located in the Clinton Hall Building, 13 Astor Place, where they will be pleased to see their friends and the trade as soon as they get fitted up, which will be in a few days.

FARWELL, OZMUN, KIRK & Co., St. Paul, Minn., issue, for the convenience of their trade, a Screw list on heavy cardboard, 7¼ x 14 inches in size. The list includes Iron Wood Screws, with the usual varieties invoiced from this list at varying discounts; Flat and Round Head Brass Screws and Flat and Round Head Nickel Plated Screws. On Iron Wood Screws the list is given; also the net at discounts of 50, 55, 60, 65 and 70 per cent., with a blank space for the price per dozen. On Brass and Nickel Plated Screws the list and net at 25, 30, 40 and 50 per cent. are given, with the same space for retail price.

C. M. HOPKINS, representing some well-known houses in the South, has removed from 90 Chambers street, New York, to 64 Reade street, where he suggests that visiting friends will find desk room and a hearty welcome.

BUEHLER, BONBRIGHT & Co., 427 Market street, Philadelphia, report business very satisfactory, notwithstanding the backward season, sales being uniformly in advance of last year. Those for the current month show an increase of fully 33⅓ per cent. over the sales for corresponding period of 1892. The new store facilities acquired by the firm last fall make the handling of increased business easier. Some further improvements are in contemplation during the present year.

Prize Competitions.

$25.00.

Prize Competition No. 20
(Reopened.)

SUBJECT:

A Reliable System for Securing the Correct Charging of All Goods Sold on Credit.

This competition closed May 6, but in view of the importance and practical nature of the subject and the exceptionally few replies which have been received from the trade we reannounce it as above and extend the time up to which responses will be accepted to June 10. The interest of this competition and the importance of having some satisfactory method of accomplishing the desired result is referred to in the following letter from a correspondent who, it will be observed, calls attention to the carelessness in this regard which is characteristic of some merchants, and expresses the hope that among the contributions received will be many of practical value:

The answers to the competitions which have been recently published in *The Iron Age* have been read by me with more than usual care. Competition No. 20, "A reliable system for securing the correct charging of all goods sold on credit," to me, is one of much interest, and I trust you may soon find a place for the answers to it in your paper. There is no other leak about a store, in my opinion, that requires more thorough calking than that occasioned by allowing goods to go uncharged. It is not unusual to hear a proprietor, when looking over the day's business, inquire, "Has this been charged?" It is the proprietor's place to have the business so systematized that errors of this or of any other kind should be of rare occurrence; and when an error is made, under some unusal circumstances, a remedy should at once be provided to prevent its happening again. The proprietor should hold himself personally responsible for such mistakes, because he has failed to provide against it. From the large amount of credit business done, and done by many firms whose system in other things could not well be improved upon, I look for very satisfactory solutions of this question in the replies which you will publish.

We hope, therefore, to hear from many in the trade with practical suggestions or descriptions of systems in use whereby the charging of all goods is assured. How to avoid charging undesirable parties without giving offense, and how to avoid charging small amounts are also points which should naturally be considered in replies.

Those intending to compete are reminded that it will not be nece sary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose for which these competitions are announced.

This competition will remain open until June 10, 1893.

The following prizes will be awarded:

First prize.....	$12.50
Second prize.....	7.50
Third prize.....	5.00

The prizes will be awarded for answers which, in the judgment of the committee of award, are most suitable for publication and of the most general interest. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than June 10, 1893. They should be addressed as follows:

DAVID WILLIAMS,
96-102 Reade street,
New York.
Prize Competition No. 20.

The committee to whom the contributions in Prize Competition No. 10 were referred have awarded the prizes as follows:

First Prize of $50 to FRED. MACEY, Grand Rapids, Mich.

Second Prize of $25 to H. P. KING, Portland, Ore.

Third Prize of $15 to G. T. EVANS, Pittsburgh, Pa.

Fourth Prize of $10 to FERDINAND TUSCH, Brooklyn, N. Y.

Other Competitions which have closed are now in the hands of the Committee of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a great deal of valuable information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 22. Closing May 20.
The Best Manner of Presenting and Collecting Book Accounts.

No. 23. Closing May 27.
Three or more Subjects for Prize Competition.

No. 24. Closing June 3.
Short Methods of Figuring Discounts.

No. 20. (Reopened.) Closing June 10.
A Reliable System for Securing the Correct Charging of All Goods Sold on Credit.

Another subject will be announced in our next issue.

We are advised that Barlow Brothers, Grand Rapids, Mich., manufacturers of Manifold Shipping Blanks, turned out in one month 770,000 of these Blanks, which they estimate, if laid out side by side, would reach over 182 miles.

Evolution of the Bicycle.

(*From the National Magazine.*)

THE primary and essential principle of the "cycle" family is that of a frame work rigged upon wheels, and propelled by the action of the person or persons whom it carries. Doubtless crude attempts to utilize this principle have been made at different stages in the world's history, and under various civilizations, but the story of the modern bicycle is a chapter of mechanical evolution which is almost entirely compassed within the last hundred years.

The earlier machines have enjoyed varying periods, both of immense popularity and entire forgetfulness. At times the crude forerunners of the present perfected wheel have excited a sudden popularity amounting almost to a craze, and including in the infatuation every class of persons; and then as suddenly have been entirely banished from the popular mind, until the sight of a machine would become the rarest occurrence.

In the year 1779, Blanchard and Magurier, two Frenchmen, constructed the first crude tricycle, which was propelled by the feet of the rider, as the French name which was soon applied to it, "velocipède," indicates. The machine was cumbersome and rude, and possessed no practical value, although its exhibition in a public square of Paris attracted the interest and admiration of the scientists and academicians of that day, as well as of the gaping crowds.

This crude invention was a notable achievement, however, as inaugurating the first stage in the evolution of the wheel, and to the inventors, Blanchard and Magurier, belongs the honor of first demonstrating the application of the fundamental cycle principle. A number of these machines, with various modifications, were soon manufactured and came into quite general use. They were contrived in all sorts of styles, from a one-wheel to a five-wheel affair, and their use spread to Germany and England.

But these pioneer velocipedes only enjoyed a very moderate popular success, and it waited for the invention of the Draisine to create a genuine craze. The Baron von Drais was a landscape gardener of Manheim, Germany, who held the position of master of the forests of the Grand Duke of Baden. Von Drais was possessed of considerable scientific knowledge and some mechanical skill, and he utilized these accomplishments in the construction of a curious machine on which he propelled himself about the Duke's grounds in the performance of his duties. In 1816 he exhibited his invention in the Garden of Tivoli in Paris. The contrivance was at once called *célérifère*, or the makespeed, and in appearance, though not in principle, it was not unlike our modern safety. It is described as "at the best an awkward affair, composed of a couple of heavy wooden wheels of equal diameter, one behind the other and joined together by a longitudinal wooden bar on which the rider's seat was fixed, the mode of propulsion being the pushing the feet against the ground."

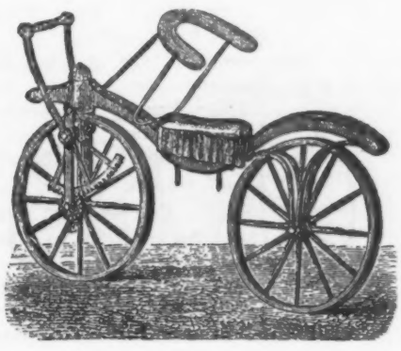
This machine came to be known as the "Draisine," in honor of its inventor, and, awkward as it may have been, in default of a better it quickly became popular, spreading rapidly throughout France and Germany. It is sometimes asserted that another machine, the "celeripede," built upon the same principles as the Draisine, but simpler in construction, was invented simultaneously and independently of Von Drais' model, and was exhibited in Paris, in the Luxembourg Gardens, during the same year, 1816, which witnessed the exhibition of the Von Drais wheel. The evidence at hand is scarcely sufficient, however, to justify an attempt to rob the German baron of the title accorded him of "father of the bicycle." In 1818 one Denis Johnson introduced a modification of the machine in England, taking out a patent in which he described the vehicle as a "pedestrian curricle." It was popularized, however, under the names of "dandy-horse" and "hobby-horse," and with these designations took its place in the polite literature of that day. The craze spread until every one who could afford the luxury was pushing a hobby-horse along the streets and over the roads of old England.

How so crude a machine could gain such a foothold cannot but be a matter of surprise to any one familiar with the present splendid wheels; and that it should eventually fall into disuse and altogether disappear as impracticable for real service was inevitable. America contributed her full share toward the brilliant but brief career of the clumsy toe-pushing affair, the machine being brought to this country in 1819, one year after its appearance in England, a patent being secured by W. K. Clarkson.

The machine was introduced, says a writer, "into New York, and, creating a great furore there, the excitement spread rapidly to other cities—Troy, Saratoga, Philadelphia, Boston and other places. A riding exhibition was opened near Bowling Green; people rode them up and down the Bowery, and on the parks, a favorite place for speed being the down grade from Chatham street to City Hall Park. Davis & Rogers, a Troy firm, manufactured a number of machines . . . and

McCall's Machine, Made After McMillan's.

Dalzell's Machine.



Gombert's Hobby-Horse.

Johnson's Pedestrian Curricle.

let them to the young men of the city at a quarter-dollar an hour."

Some improvements were engrafted upon the original machine, notably by Louis Gomperts in 1821, who attached a rack and pinion gear to the front wheel. But as nothing was contrived which would serve to take the vehicle out of the place of a mere means for amusement, and establish it as fit for practical service, its popularity naturally disappeared as the novelty wore away.

The Draisine, or hobby-horse, resembled the modern safety in that it consisted of two wheels of about the same size, above which, and suspended somewhere between the two, the rider's seat was fixed; but it very radically differed from the present wheel in the utter absence of any suggestion of the modern crank and pedal or chain arrangement which provides the means of propulsion. In fact, the use of pedals did not suggest itself for a great many years after the appearance of Von Drais' ground-pushing-with-the-toe affair, and during all this period the bicycle idea remained in obscurity.

Until about a year ago the earliest date fixed upon for the invention of a true bicycle was 1845, the accredited inventor being Galvin Dalzell, a Scotchman of Leswahgon, in Lanarkshire. Dalzell was a merchant, but possessed of considerable mechanical genius. His machine was somewhat in the style of the modern "safety," both wheels being, however, very small, rendering the wheel incapable of great speed. Cranks were attached to the axle of the rear wheel, and were connected by rods to pedals located between the wheels, while above the pedals was the seat of the rider.

This was regarded as the first two-wheeled single-track vehicle wholly supporting its rider upon the wheel base, of which there was any knowledge, and, as is readily seen, it embodied every fundamental principle of the modern machine. Nevertheless, it somehow failed to attract much attention, and not proving satisfactory to its inventor, there is no evidence that more than a single machine was made by him.

But recent investigations have discovered a serious competitor for the honor so long accorded Dalzell, of having applied a driving gear to the hobby-horse. In a letter published in *Bicycling News*, in February, 1892, Thomas McCall declares that a machine with pedals was invented "by a blacksmith by the name of Peter McMillan, who wrought at Drumlanarig Castle for some time, and latterly on his own account at Pierpont, Dumfriesshire."

"I remember," he continues, "when a boy, on coming out of school one day, seeing him with his velocipede. I followed him as he led it up a long hill, and made a thorough inspection of it. On gaining the top of the hill, the man got on and rode away. I ran for over half a mile, but he outstripped me. It was after his principle that I made velocipedes, years after."

McCall fixes the date of his first glimpse of McMillan's machine at about 1845, but other witnesses state the first appearance of this invention to have been somewhere between 1838 and 1841, which clearly antedates Dalzell's machine. But whatever the truth may be—whether Dalzell copied from McMillan, or the latter profited by a sight of Dalzell's invention—both were Scotchmen, and to their country belongs the honor of the invention of the first true bicycle; although the coincidence of country would seem to lessen the probabilities of independent inventions by the two men.

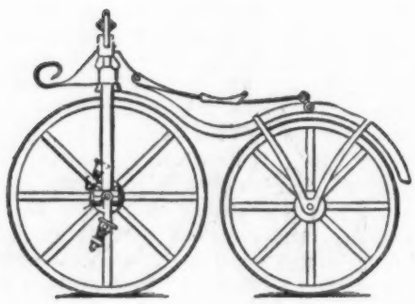
Strange to say, in view of their great superiority over previous attempts at vehicles of this sort, neither of these machines created any stir, nor are known to have been adopted by any one except their inventors. The original Dalzell machine, and the only one known to have been made, is still in existence. As described by *Bicycling News*, it is "constructed chiefly of wood which, though worm-eaten, is still wonderfully strong, especially in the wheels, these seeming to have stood the ravages of time and rough usage much better than the frame work. The rear wheel—the driver—is of wood, shod with iron, about 40 inches in diameter, and has 12 spokes, each about 1 inch in diameter. The front wheel is of similar construction, but only of about 30 inches in diameter.

"From the front wheel hub, the fork—straight, and with a rake, which some of our modern makers could copy with profit—passes up, and is joined together, through the fore part of the wooden frame work. A pair of handles are then attached and bent backward into a V-shape, to suit the rider, who sits about 2 feet behind the front wheel hub. These were commonly termed the 'reins.' The main frame is somewhat like that which is now termed the 'dip' pattern, the design of which is applied in an extended form to ladies' safeties.

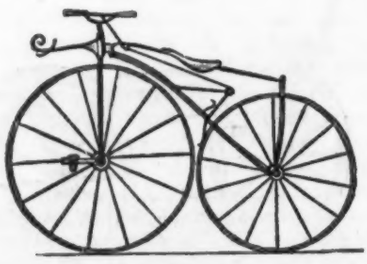
"A wooden mud guard rises from this frame, covering about one-fourth of the circumference of the hind wheel; from this to the back forks, which are horizontal, and of wood, vertical flat stays run down, forming a dress guard after the manner of those on the latest cycling development—the ladies' safety. The action thus obtained is not rotary, being a downward and forward thrust with return, the feet describing a small segment of a circle. That the gearing, which constitutes the chief wonder to the critical and historical reader, was actually on the machine while ridden by Mr. Dalzell, is

The French Celeripede.

The Draisine.



Lallement's Velocipede.



American Velocipede of 1869–70.

proved by the receipted accounts of the blacksmith, John Leslie, who made all the iron work used in its construction."

Improvement in cycle making was at a standstill for some time after the achievement of Dalzell. The origin of the modern bicycle was for a long time dated from 1865, when the Frenchman, Mauschal, in March, and his fellow countrymen, Woirin and Leconde, in September of the same year, applied the crank and foot pedals to three-wheel and five-wheel velocipedes. Very soon thereafter another Frenchman, Pierre Lallement, attached this improvement to a bicycle. Whether this idea was an original invention of any of these Frenchmen or whether they were all alike indebted to Dalzell and his machine of a score of years before will probable never be known.

Lallement was a mechanic in the employ of one Michaux, manufacturer of baby carriages. The young machinist constructed a genuine bicycle—a machine crude enough and yet embodying the fundamental principles of our present wheels. This vehicle, like its predecessor, Dalzell's machine, was a safety, both wheels being of the same diameter, with a seat between them elevated a convenient distance above the pedals. Lallement learned to balance and to ride his bicycle, and it attracted some attention as a mechanical wonder, his employer exhibiting it at the Paris Exposition of 1865.

This was the story long believed. But investigations have tended to take from Lallement much of the credit formerly conceded him, much as Dalzell has suffered for the sake of McMillan. Thus, by the new version, the employer, Michaux, rather than his workman, Lallement, was the one to revive McMillan's idea of the application of a driving gear to a bicycle; while the date fixed upon for this event is sometimes put as early as 1855. It is said that an old Draisine was brought to Michaux to be repaired, and that in course of time he conceived the idea of propelling the hobby-horse by means of a system of cranks and pedals.

But whatever other credit may belong to Lallement, he certainly enjoys the distinction of having first introduced the new Paris machine in America, to which country he came in 1866, working his passage across the Atlantic as a stoker on one of the steamers. While wandering through Connecticut seeking employment he built one of his machines and rode it about. Among other places he visited New Haven, where he attracted considerable attention, and especially won the admiration of a man named Carrol. The latter eventually induced the Frenchman to patent his invention, and during that same year, 1866, the patent was issued jointly, in the names of both Carrol and Lallement. The model on which they secured their patent is described as consisting of "two wooden wheels, with iron tires, of nearly equal size, one before the other, surmounted by a wooden perch, from which projected downward, near its rear end, two arms on either side the rear wheel, each pair of arms meeting at the end of the hub and forming a bearing for the end of the axle; one similar wooden bar projected from the fore end of the perch on either side the forward wheel, furnishing bearings for its axle, and arranged with a pivot in the perch near the upper end so that, by means of a handbar above, the fore wheel could be turned in either direction.

"The perch was curved downward in the middle part, and from a joint near the fore arms (or fork), backward to a joint over the rear wheel, extended a straight steel spring, bearing a saddle for the rider about midway and over the space between the two wheels. From this position he could place his feet upon the balanced pedals on the cranks connected with the front axle, the latter being a fixed one in the wheel, and thus seated, he started the machine in motion with his feet on the ground, as always in the Draisine, and then put them on the pedals and propelled it."

In this machine the front wheel was both driver and steerer, as is the case with the familiar high wheel or ordinary, which developed from it. The cycles of McMillan and Dalzell, on the contrary, employed the front wheel as steerer and the rear wheel as driver, as is done in the modern safety. A year or two later Lallement returned to France, where he presently established himself as a manufacturer of the new machines.

About the time Lallement introduced the bicycle in America, a similar but better machine was made by Edward Gilman, an Englishman. His machine is described in the British Patent Office under date of August 1, 1866, and was superior to Lallement's wheel in having the rider seated more directly over the pedals, and making the rear wheel the driver, as in the modern machine, thus utilizing the weight of the rider, as well as active muscular force in propulsion.

These new machines very soon grew popular, until at length another craze was inaugurated. This movement began in France. "In the winters of 1866 and 1867," says Mr. W. F. Adams, "bicycling was the hight of the Parisian fashion. Every one who claimed to be anybody possessed a velocipede, from the Prince Imperial downward. . . . In the Bois de Boulogne little paths were laid among the trees for the riders. Tiny narrow bridges were erected over the lakes, across which the wheelmen rode on to the islands, and sometimes, after refreshing themselves unwisely at the restaurants, toppled off into the shallow water in effecting their return."

Various improvements were added to these machines. In November, 1868, C. K. Bradford, an American, suggested the use of the rubber tire. In November, 1868, Edward A. Cowper, an Englishman, introduced the suspension wheel and anti-frictional bearings. Up to this time all the machines made resembled our safety in general appearance, but in March, 1868, Louis F. Reviére, a Frenchman, then residing in England, secured a patent for a machine, of which "the forward wheel was somewhat larger than the back one." A similar machine was patented in the United States in 1869, and in the same year began to be manufactured in Paris by Michaux. This was the beginning of the ordinary, or bicycle with the large front wheel, which, until a few years ago, was the prevalent style of wheel.

The popularity of the new machines was rapidly augmented until it reached its zenith in the winter of 1869–70. Large numbers of the machines were manufactured in France, England and America, and in this country rinks were built and the machines rented out to riders at the rate of 25 cents an hour. A tremendous business was done in this way throughout New England and other parts of the United States.

The wheels were termed "velocipedes," the name "bicycle" not yet having come into use. In fact, the first occurrence of this name which we find is in an English patent granted one J. J. Stassen, who, in his application declares: "My invention relates particularly to the construction of velocipedes known as the bicycle."

In 1869, in the midst of the furore over the new bicycle, or velocipede, a special journal, *The Velocipedist*, was founded. This is notable, both as illustrating the fever of enthusiasm which had been aroused, and also from the fact that *The Velocipedist* was the pioneer among periodicals founded in the interest of cycling.

In view of the subsequent occurrences, a curious interest attaches to the words of a writer of this period, who, in comparing the popularity then enjoyed by the velocipede with past periods of craze over former and ruder wheels declared: "The machines now in use are so radically different from those of 50 years ago, so perfect in propelling power, so easy to ride, so swift of motion, so useful as a means of conveyance, that it seems impossible for history to repeat itself with regard to the present mania."

Yet notwithstanding the confidence of this man, and of the many others who had invested their capital in rinks and velocipedes, history did repeat itself; and the words were hardly out of this writer's mouth, so to speak, when the decline began. The winter of '69–'70, as has been stated, saw the craze at its hight, but the following spring, when it was discovered that the machines were too clumsy for travel on the roads, the popular interest in them suffered a complete collapse, and in a very short time the unhappy velocipede was effectually banished from the United States. The brave journal, *The Velocipedist*, fell from grace with the unfortunate vehicle it had sought to champion, and was hustled into an early grave.

In England, however, the velocipede continued in a feeble and desultory manner to exist, while a number of mechanics puzzled their brains to discover improvements which might restore the fallen favorite to favor, and thus, incidentally, make the discover's fortune. This process produced a gradual metamorphosis, and while the machine gradually dropped its unluckly name of "velocipede" and assumed the new style of "bicycle,"

it also changed its form until it consisted of one very large and one very small wheel, becoming the famous ordinary, which reigned supreme in the bicycle world until a few years ago, since which time the modern safety has been rapidly and relentlessly pushing it to the wall.

The ordinary was introduced in this country from England by a maker, who, in 1876, exhibited the machine at the Centennial Exposition in Philadelphia. During the following year a number of these machines were imported from England, where they had already begun to come into use, and not long thereafter their manufacture began in a small way in this country, gradually developing into its present astounding proportions.

The picturesque ordinary gradually grew into immense popularity, and its manufacture became a considerable industry, but it needed the introduction of the wonderful modern safety (first made in Coventry, England, in 1886, and first manufactured in the United States in 1887), to bring the wheel into the unprecedented and constantly increasing popularity which it now enjoys.

Many lovers of the ordinary rebel against the unsentimental practicality which relegates their picturesque machine to the rear in favor of the more rapid and serviceable safety. But a careful study of the history of the cycle must direct the sentiment, if we are to consider that, to the other side, for the ordinary is the interloper—and a plebeian at that, dating his ancestry back only to '69—while the safety is a return to the original style of the earliest toe-pushing hobby-horse, and the McMillan and Dalzell cycles which followed.

Since 1877 the popularity of bicycling has been constantly increasing, with never a halt or a step backward. In December of that year was started the *American Bicycling Journal* of Boston, and this periodical still endures, but sharing its special field with innumerable and prosperous rivals. The City of Boston also boasts the organization of the pioneer Bicycle Club in the United States, although the formation of other important clubs at Springfield, Mass., and various other points, soon followed.

As to the future of the bicycle, it may be asked: Is there no danger, despite its present popularity, in the repetition of history and the downfall and disuse of the present machine.

In answer, we need not argue the mechanical perfection of the present wheel, and its wonderful popularity, amounting almost to universal use, among civilized nations. It is enough to point to what the machine has done—the records it has made. It is enough to say that the fastest time ever made by the fastest trotting horse, from a short quarter of a mile to two or three miles, has been lowered many seconds by the man on a wheel, while for long distances—anything more than a mile or two—the horse has never stood any chance whatever for many years. Moreover, the wheel can climb or descend mountainous ways with much greater facility than a horse, and is practicable on almost any sort of road or bridle path where the quadruped dare venture.

It follows, therefore, that the bicycle has become a necessity where fast traveling by the individual is the end desired, and is in a great degree rapidly taking the place of the carriage and saddle horse as a form of locomotion supplemental to the steam car. Thus we do not see what can ever displace the bicycle, except it be the invention of some simple and inexpensive flying machine, which shall hurry us through space as on the wings of the eagle.

Mallory Standard Shutter Worker.

THE MALLORY MFG. CO., Flemington, N. J., succeed F. B. Mallory in the manufacture of Mallory's Standard Shutter Worker, and with the organization of the company the facilities for making these goods have been largely increased. New inside designs and patterns have also been introduced. The fixture takes the place of the lower shutter hinge, and consists of a rod which passes through the side of the window frame into the room, to the inner end of which a small crank handle is attached. The fixture can be attached to old houses as well as to new ones, as the only cutting required is a half inch hole bored through the casing, and its attachment does not interfere with the sash weights. On the outer end of the rod is a thread which engages in a cogged wheel, which is attached to the hinge part of the fixture. When it is desired to open or close the blinds, the handle is turned. It is stated that the blinds are opened, closed, bowed, or fixed in any position by turning the handles on the inside of the room, and without raising the window, screen or curtain; also that the blinds are locked automatically in whatever position they may happen to be left, and can never slam. It is explained that the worker is made of the best gray and malleable iron, in order to give it extra strength. The handles and escutcheons for the inside, are made in imitation bronze, brass, bronze and nickel plated.

Price-Lists, Circulars, &c.

RUSSELL & IRWIN MFG. COMPANY, New Britain and New York: Supplement 1893. Illustrations are shown of Front and Vestibule Mortise Knob Locks, Knobs, Escutcheons, Bronze Sliding Door Locks and Escutcheons, Wrought Steel Mortise Knob Locks, Knobs and Escutcheons, Push Buttons, Store Door Handles and Lock, Sash Fastners, Drawer Pulls, &c. The illustrations are finely executed, showing elaborate and artistic designs.

ENTERPRISE MFG. COMPANY, Philadelphia, Pa.: Illustrated catalogue under date May, 1893. The book contains 64 pages, illustrating with descriptions and prices their line of Hardware productions. Attention is directed to their latest specialties, including Ice Shredders, Fruit Augers, Flag Holders, Shoe Stands and Lasts, Bull Frog Door Weights, Cherry Stoner No. 12 and Meat Choppers Nos. 3, 33, 44 and 72.

PARRY MFG. COMPANY, Indianapolis, Ind.: Planet Bicycles. This company have added to their line of Buggies, Surreys, Spring Wagons, &c., the manufacture of high grade Bicycles. A catalogue is devoted to a description of the Double Diamond Frame Planet, showing illustration of the same with prices.

THE MILLER LOCK COMPANY of Frankford, Phila.: No. 10 catalogue containing 22 pages and covering the Lock Cylinders, Rim Latch Locks, Rim Store Door Dead Locks, Drawer Locks, Cupboard Locks and Chest Locks, made under the Jackson patents, and their well-known Champion Locks, Champion Cash, Deed and Bond Boxes, Jackson's Automatic Padlocks and Cyclers' Specialties. The Jackson Locks are the inventions of Chas. D. Williams, an expert in Lock picking, who declares that these Locks are non-pickable.

BRABSON BROS, 78 and 80 Mechanic street: Newark, N. J.: A new catalogue of Refrigerator and Bar Hardware. An introductory states that they make special goods from models or designs, furnish Brass Castings, do grinding and polishing and electroplating in Nickel, Silver, Copper or Brass. Then follow cuts and prices of Images in various designs, Ring Plates, Catches, Buttons, Handles, Handrail Bar Brackets and Footrail Brackets. The cover is devoted to Clodek's Patent Standard Spring Catch and the Climax Refrigerator Door Fastener, which is well-known and popular.

Manufacturing.

FAYETTE R. PLUMB of Frankford, Phila., manufacturer of Edge Tools, Hammers, &c., has just equipped his factory building with the Kane Automatic Sprinkler. The outfit contains 620 sprinklers in all. He has also added a 3-story brick building, 33 x 85 feet, to be used as a packing house for the storage of grindstones. The new building fronts on the railroad and the basement has been fitted with a crane and elevator to facilitate the unloading and storing of grindstones. As Mr. Plumb uses over 500 tons of grindstones in a year the new building will prove very convenient.

Among the newly-licensed corporations in Illinois are the following Hardware concerns:

The Kenning Hardware Company, Chicago; capital stock, $15,000; incorporators, Charles W. Kenning, William A. Roth, Frank J. Pauller, Thomas G. C. Thye.

The C. Carr, Jr., Hardware Company, Chicago; capital stock, $25,000; incorporators, Christian Carr, Christian Carr, Jr., and Niels M. Lindberg.

C. Cowles & Co., New Haven, Conn., advise us that their business has increased considerably during the last year or two. They find their new buildings well adapted to their manufacturing purposes. They state that they have more than doubled their line of Carriage Lamps and are supplying the trade in all sections of the globe with them. Their exhibit at the World's Fair is located in the Transportation Building and is alluded to as the first set up in that building.

The Hartman Mfg. Company, makers of Wire specialties, including Fence Materials, Tree and Flower Guards, Wire Mats, &c., whose works are at Beaver Falls, Pa., have been compelled, through lack of room at their former New York offices, 102 Chambers street, to move into more commodious quarters, and may now be found at 277 Broadway, at the corner of Chambers street.

Clarence M. Kemp, Baltimore, Md., advises us that he has from time to time added to his line of Pipe Vises until he is now putting on the market an assortment equal, he claims to any

other manufacturer. Mr. Kemp is intending to add to this line gradually and hopes to offer such a variety and to quote such prices as will insure him a large trade in this department of his business.

The Newark Nickel Plating Company do electroplating in gold, silver, nickel and copper. Some idea of their capacity can be gained from examples of the work they have done. They have plated a fly-wheel of 10-foot diameter and 3-foot face, all of the parts for a 60 horse-power engine and rolls weighing 600 pounds. Work of extraordinary character has found its way to their establishment from many large manufacturing plants, and has been finished in a highly satisfactory manner. Besides this business they make a specialty of developing experimental machinery or appliances. One of their inventions is the Bergfels Bicycle Saddle, which is made both for racing and road use. W. H. Bergfels & Co. are the proprietors, and are located at 44 to 52 Lawrence street, Newark, N. J.

The See Standard Shovel Company, 525 to 533 West Fifty-fourth street, New York, have succeeded to the business formerly carried on by A. See & Son, as manufacturers of Shovels, Scoops, Spades, &c. The capital stock of the company is $15,000. John S. Huyler is president of the company, Emerson E. McCargo, vice-president, and E. Garnier See, general manager.

Edward Zusi, 78 Mechanic street, Newark, N. J., makes castings of Brass, Composition Metal and German Silver. Long experience and careful workmanship are referred to as enabling him to turn out fine Castings which are in demand from the Saddlery Hardware trade.

Joseph B. Mayo started the manufacture of fine electro silver plated ware in 1870, and now his plant and show rooms extend from 58 to 62 Mechanic street, Newark, N. J. His line provides everything in this line required for the dining room, besides many ornamental goods. Ice Pitchers and their Trays and Goblets are now referred to as in great demand.

Announcement is made that the Plumb & Lewis Mfg. Campany, Grand Rapids, Mich., have sold the patents, trade-mark and good will of their Wringer business to the American Wringer Company, 99 Chambers street, New York, who will hereafter supply the trade with the Gem and other Wringers heretofore manufactured by the former company. It is stated that the high quality of the Gem Wringer will be maintained by the American Wringer Company, who also announce that they are manufacturing their own rubber rolls and are thus in a position to furnish Wringers of all kinds at the lowest possible prices. The Plumb & Lewis Mfg. Co. will continue the manufacture of Carpet Sweepers as heretofore.

Paints and Colors.

It should be understood that the price quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There has been a more cheerful tone to the reports on business in leading lines of Paints and Colors during the past week. It is admitted that the financial situation holds many building enterprises in check, thereby restricting the consumption of Paints more or less at various points, but more seasonable weather has helped trade in no unmistakable way, and to all accounts the past week has been the best one of the spring season as far as distribution is concerned. There have been few and only unimportant changes in prices and the general market may be said to retain a very good tone. Particularly is this the case in the instance of bulk goods, taken chiefly by grinders, and in the instance of leading pigments.

White Lead.—Large orders have been few and far between, but the distribution of moderate quantities has increased to a gratifying extent and, in that respect, the experience contrasts favorably with the movement during the preceding two weeks. On prices there is no change to note. Reports of more or less irregularity in some distant out of town markets still have circulation, but at this point there do not appear to be any concessions outside of those that have been common in jobbing circles for some considerable time past. Corroders in this vicinity are working to their full capacity and delivering quite as much Lead as they usually do at this active season of the year.

Red Lead and Litharge.—Glass makers are very moderate buyers of Litharge, since the usual period of curtailment of production is near at hand, but the demand from other sources keeps up remarkably well. Red Lead has met with somewhat better sale, chiefly in moderate quantities. Prices remain without change of importance.

Oxide Zinc.—The movement of domestic product, taking together new orders and deliveries on old contracts, has been quite brisk. A firm feeling prevails, but prices are without change, the quotations ranging from 4½¢ to 5¢, as to quality and quantity. The demand for French Zincs is moderate and prices are unchanged. Thus far the market for American or foreign brands does not appear to be affected by the reaction in prices of crude material.

Colors, &c.—There has been a better trade in leading lines of Dry and Oil Colors. Business in ready Mixed Paints and Metallic Paints has also been very good; larger, if anything, than during the preceding week. Prices are still somewhat variable, however, under the influence of sharp competition in various departments, but show no radical change.

Miscellaneous.—Dealings in Block Chalk have been moderate, but stocks in transit are nearly all sold, and with fair demand prevailing prices remain quite firm. Whiting has met with good sale at full former prices. Putty is irregular in value but moving quite freely, with reputable brands faring the best. There has been nothing out of ordinary movement in Barytes or the general line of Clays, and prices show very little fluctuation.

Oils and Turpentine.

Apart from some additional large transactions in Cotton Seed product during the early season, there has been little doing outside of routine business in this market. Prices have ruled firm, except for some few minor Oils, and, taken as a whole, the market shows very good form, being affected very little, if at all, by financial conditions that have caused more or less curtailment of purchases in many other branches of trade. As a rule, supplies are well under control, and that fact doubtless has as much to do with present firmness as does the volume of business.

Linseed Oil.—There has been a brisk movement of city made Oil and somewhat freer sales of outside brands also, making altogether a full average movement for the season. The market has been very firm as well as active, although price for raw material has averaged somewhat lower, and that of Oil Cake a little higher. The general quotation is 50¢ for Raw Oil, and the only concession has been in the instance of some New York State brand from second hands.

Cotton Seed Oils.—There have been transactions involving about 3000 barrels Crude and 8500 Refined product, the greater portion of which was taken for direct shipment from the mills to various points, including 3000 barrels for export to Holland. Spot business was chiefly at 48¢ for Prime Crude and 51¢ for Prime Summer Yellow. Of the latter there were a few sales at 52¢ for June and 53¢ for July delivery. The market closed quite firm, although demand was not as lively as during the early part of the week.

Lard Oils.—Business has been almost wholly of routine character and only fair all told, but production is kept down so closely to actual orders that no accumulation takes place. Hence prices remain easy and are now quoted on the basis of 85¢ @ 86¢ for strictly prime quality stock.

Fish Oils.—Several hundred barrels of crude Whale Oil have been purchased for export, cleaning up all the stock there was in first hands in this country. Sperm Oil has been very quiet, however, but without change in price. Cod Oil steady at former prices but selling rather slowly.

Olive Oil.—Common Olive Oil in barrels is a shade cheaper, owing to freer offering of stock on the spot and to arrive. Fair purchases were made at 58¢ @ 60¢, according to position of stock and quantity.

Miscellaneous.—Cocoa-Nut Oil has met with slow sale, and the market is easier at 5⅞¢ @ 6¢ for Ceylon and 6¾¢ @ 6⅞¢ for Cochin on the spot. Neatsfoot Oil is firm at 75¢ @ 80¢ for prime and selling very fairly. Red Saponified Oil is easier at 5¼¢ @ 5½¢, but Elaine remains unchanged.

Spirits Turpentine.—There has been a fair volume of business and rather more life to the demand. Under the influence of the same prices have hardened somewhat. Sales were made at 31¼¢ for regular and 31¾¢ for machine barrels.

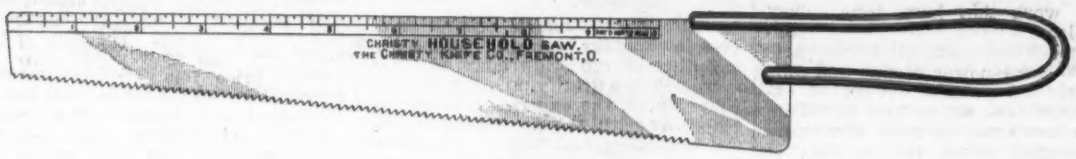
Timbale Iron.

The accompanying cut represents a timbale iron, introduced by the Union Mfg. & Plating Company, Freeport, Ill. The head and blade of the article is a finely-plated casting, either plain round or fluted round, with a hand-polished black walnut handle. In use the head is dipped into hot lard and then into batter, thus giving crullers the form of the head.

Timbale Iron.

Christy Meat and Household Saw.

The Christy Knife Company, Fremont, Ohio, are introducing this article, as herewith shown. The blade is 12 inches long, with a scale measurement etched upon its upper edge. The wire handle is 4 inches long, securely fastened to the blade. The saw is heavily nickel plated and, it is stated, of excellent quality. It is designed for use about the house, for cutting the bone of ham or other meats, also for light work for which a saw is often needed.



Christy Meat and Household Saw.

Bee Smokers.

The accompanying cuts represent bee smokers, being offered to the trade by A. I. Root, Medina, Ohio. The improved Clark smoker, shown in Fig. 1,

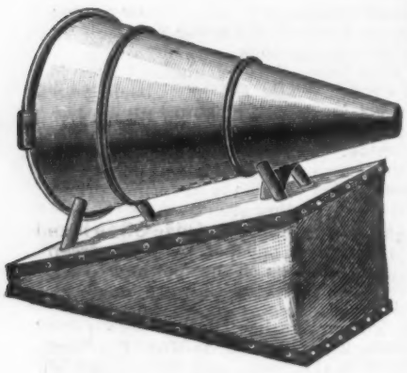


Fig. 1.—Cold-Blast Smoker.

is adapted to the use of planer shavings, excelsior mixed with saw dust, and soft rotten wood. The smoker is provided with a door at the large end for filling, and sandpaper beside the fire pot for lighting the match. The Crane smoker is shown in Figs. 2 and 3. The fire barrel is lined on the inside with as-

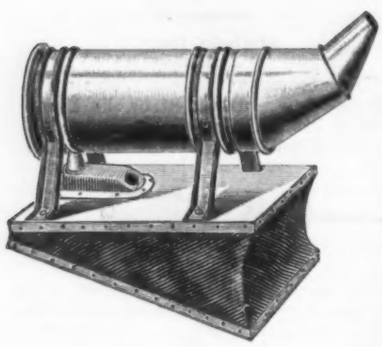


Fig. 2.—The Crane Smoker.

bestos and sheet iron, as is also the cone, to prevent them from becoming uncomfortably hot, or filling up inside with creosote. They also avoid the use of shields, which, it is explained, are liable to get bent or caught. The principal feature of the smoker is referred to as being the valve and fire cup, shown in Figs. 4 and 5. The point is made that the bellows are large, with a durable elastic spring inside, and that the valve proper is held in position by another spring. The manufacturers state that the Crane hot-blast smoker has the strong blast of the Clark with

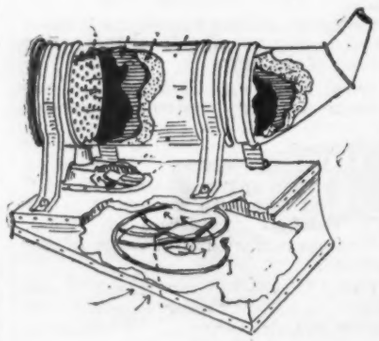


Fig. 3.—Construction of the Crane Smoker.

all the advantages of the hot blast; that it makes no difference whether it

Fig. 4.—Valve.

is crammed tightly with fuel or not, as it will deliver the same force of hot

Fig. 5.—Fire Cup.

blast as when empty, and that the smoke is not sucked into the bellows.

The Miller Lock Company of Frankford, Philadelphia, are making an attractive exhibit of their locks at the World's Fair. They are located in the Manufactures Building, ground floor, No. 11, Section P, Block 3. Across the main isle from the company's exhibit is the exhibit of Thos. Kane & Co., the Chicago agent of the Miller Company, where is shown a line of postal fronts in Government standard designs, as supplied by the company for postal services. A full line of their Railroad Switch Locks may be seen in the exhibit of Fairbanks, Morse & Co.'s Railroad Appliances. They have been furnishing Locks for railroad systems for a comparatively short period, but their business in that direction, we are informed, has grown rapidly, as they are now furnishing their Locks to about 25 railroad systems.

Spray Pump and Nozzle.

The accompanying cuts represent articles being put on the market by The Deming Company, Salem, Ohio. The Gem Spray pump, shown in Fig. 1, is described as having all working parts

Fig. 1.—Double-Acting Brass Spray Pump.

of brass, galvanized air chamber, and as furnished with Mystery combination spray nozzle. As shown in the cut, the pump is used in a common wooden bucket. By detaching the foot rest and clamp the pump may be placed over

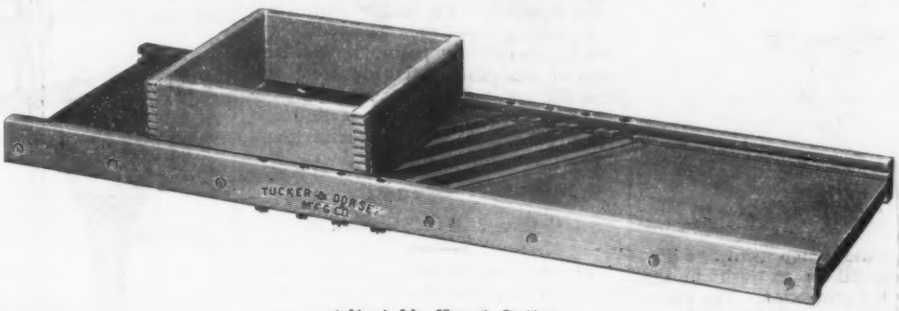
Fig. 2.—Vermorel Spray Nozzle.

the bunghole or on the end of a barrel; an additional piece of ¾ inch suction pipe only being necessary to adapt it for use this way.

The spray, Fig. 2, is referred to as an improvement in this direction, as throwing a fine spray and as being simple in construction. It is provided with a degorger and button threaded for lance, as used in their Knapsack sprayers.

Adjustable Kraut Cutter.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind.. are introducing this article, as herewith illustrated. The device consists of rocker-shaped bearings under the ends of the knives, which are held in position by bolts secured underneath by wing nuts. To adjust the knives the bolts are loosened, the knives set at the desired angle and the bolts tightened again. By taking out the bolts the knives are released and may be removed for cleaning or sharpening. It is remarked that any number of different adjustments may be made without fear of wearing down the bearings and thereby throwing the knives out of line. Among other features in the cutter the manufacturers call attention to the following: The frame work, side strips and sliding box are heavy, and are made from thoroughly seasoned hard wood, and the grain of the wood forming the body of the cutter is run crossways as an additional safeguard against warping, and the knives are strongly made of highly tempered steel, finely ground. It is claimed that the knives will last a lifetime, and that they will not bend and give down when in use, but will preserve an even cut.



Adjustable Kraut Cutter.

The Climax Rail.

The accompanying cuts represent a rail and sheave for parlor sliding doors,

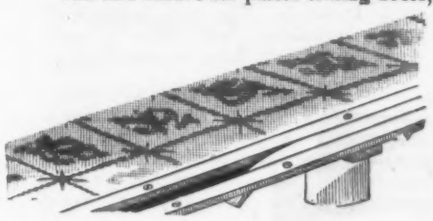


Fig. 1.—Climax Rail.

manufactured by the Climax Rail Company, for whom Crane & Halpin, 62

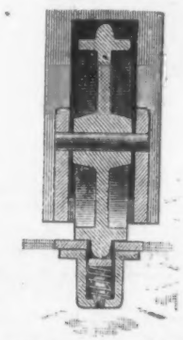


Fig. 2.—Climax Anti-Friction Sheave.

Reade street, New York, are agents. The rail, Fig. 1, is of polished brass, and when in position is level with the floor. The strip in the center is independent of the sides and is supported on

Fig. 3.—Sheave Running on to Brass Rail.

spiral springs 8 to 10 inches apart. Brass pockets riveted on to the under side of the rail contain the springs, one of which is shown in Fig. 1. Holes for the pockets are bored with a $\frac{9}{16}$ bit. The brass rail extends only to the casings and at these points the end of the center strip is bent down as in Fig. 1, to allow the shoulder of the sheave to begin to depress it, as shown in Fig. 3. Back of the casing, in the recess, iron rail is used with no center strip. The sheave, Fig. 2, has a center shoulder on its face to depress the center strip of the rail when the door is upon it, while the raised surfaces of the wheel's face on each side of the shoulder bear upon both of the side rails. The weight of the door is entirely upon the side rails, the center shoulder merely acting as a guide to the sheave. The center strip rises to the level of the side tracks when the door is pushed back into the recess, Fig. 3, thus presenting no unsightly nor inconvenient obstruction, nor does it leave a space which is liable to be filled with dirt or trash.

The rail being level with the floor offers no obstruction to the moving of furniture, nor is there danger of persons tripping over it passing from one room to another, in walking or dancing. The manufacturers state that the rail is of simple and durable construction; that the doors run smoothly and without noise; that it is impossible for the door to get off the track; that it can be put down in old buildings as well as in new ones, without disturbing paint or casings, and that every rail is guaranteed by them for five years. Rail is made in three sizes: regular, heavy and extra heavy. Anti-friction sheaves are supplied in 5 and 6 inch, or Hatfield in 4 and 5 inch.

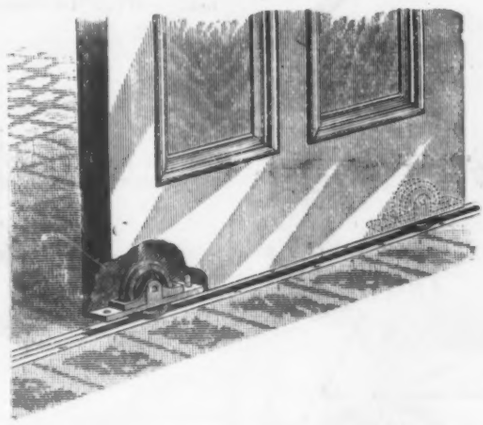


Fig. 4.—Position of Center Strip with the Door Shut.

The Whitman & Barnes Mfg. Company are erecting a large factory at Chicago for the manufacture of mower and binding knives, Diamond twist drills, spring keys and cotters, agricultural and machinist wrenches. The plant covers a large amount of ground and will be modern in arrangement and appointments.

The Excelsior Cutlery Company have been organized at Worcester, Mass., with the following officers: Emanuel Trotz, president; William Budberg, vice-president and manager; Anders Werner, treasurer, and Axel Jungmarker, secretary. These persons with Carl W. Bildt comprise the board of directors. The company will for the present manufacture Razors only, but later on will engage in the manufacture of other Cutlery and etchings in Iron and Steel. They state that they will employ skilled workmen from Sheffield, England, and Eskitstuna, Sweden, and will thus be able to turn out a large variety of first-class Razors.

Tornado Tank Pump.

Irving W. Fox, Rochester, Minn., is offering the pump shown herewith. The pump is described as having a tight discharge to the tank to prevent the water from slopping out when going up hill; also as having a lever valve in the discharge to close when using the discharge hose to fill or to wash out the boiler, or for fire protection. The pump is provided with a suction hose clevis with a rubber gasket cemented in, for attaching hose to the lower end of the cylinder. The point is made that the handle is suitably located, so that the operator does not have to stand in the mud nor tire his back, and that the handle works much easier than a rocking lever, though the pump will be fitted with a rocking lever at no additional expense, when so ordered. All the valves, being the principal wearing parts, are leather packed, and, it is stated, can be quickly and easily renewed, as the whole pump can be taken apart in a few minutes with a common wrench, no tongs or special wrenches being required for this work. By coupling the discharge hose on to the hose nipple at the top of the front of the cylinder, and closing the valve near the tank, it makes a force pump. By screwing the cap on the hose nipple and opening the valve it becomes ready for forcing water into the tank. It is remarked that it is as near frictionless as it is possible to make a pump, there being no side strain; and that the suction hose couples on the pump at an angle of 45°, which prevents the hose from kinking. The maker states that the packing surfaces are machine finished, the cylinder polished, the castings of malleable and gray iron, and that the pump throws a large amount of water quickly, as the cylinder is 5½ x 10 inches inside measurement, making it useful as a fire engine.

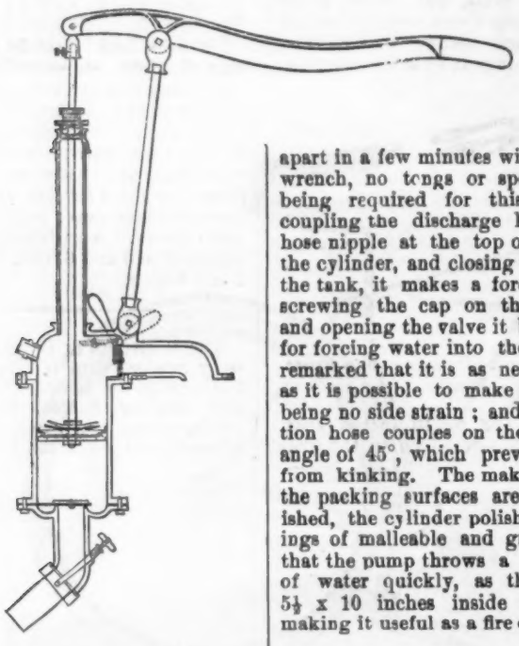


Fig. 1—Tornado Tank Pump.

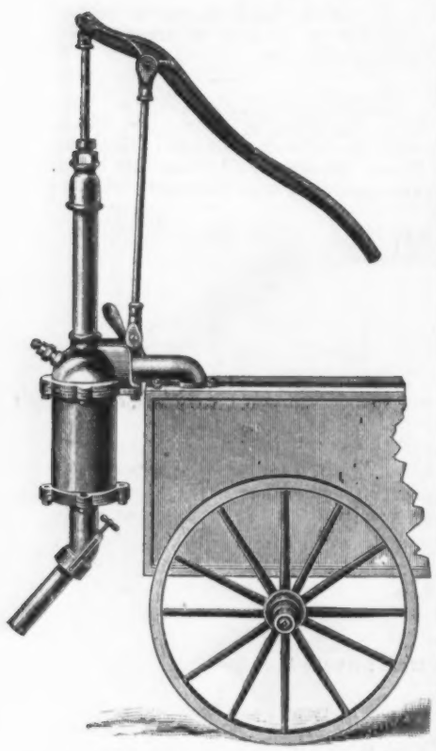


Fig. 2.—As Used for Steam Thresher.

Cataract Window Brush.

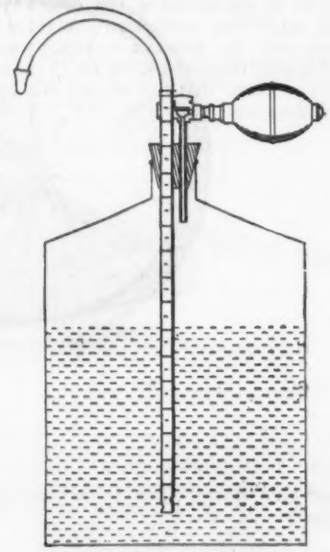
The window brush illustrated herewith is being introduced by the Enterprise Brush Company, 17–21 College place, New York. The wooden head of the brush is 3 x 8 inches in size, into which the horse-hair bristles are fastened. Above these is a metal reservoir, of the same size as the head and 2 inches high, to which a socket for handle is attached. On the top of the reservoir on the opposite side from the handle is a hole ⅞ inch in diameter. In the bottom of the reservoir are perforations corresponding to openings in the wooden head. When the reservoir is filled, by placing it in a bucket of water, the perforations permit a sufficient quantity of water to escape through the bristles upon the glass when washing windows. Upon the top of the reservoir is a rubber drier, which is brought into use by reversing the brush. The reservoir is finished in blue with gilt lettering.

Cataract Window Brush.

The Watertown Brass & Mfg. Company, Watertown, N. Y., have purchased the plant formerly owned by the W. R. Baker Mfg. Company. W. R. Baker has been engaged by the new company to act as superintendent of the factory. The company's principal product is boat Hardware, on which they hold patents for center boards, rudders and out-riggers. They will also manufacture a line of Plumbers' Goods, and are in the market for any special work pertaining to Brass Castings and finishing. The officers of the company are J. B. Wise, president, and F. R. Huntington, secretary and treasurer. The board of directors consists of Messrs. Wise and Huntington and W. W. Conde, C. R. Remington and Geo. S. Hooker.

Universal Lamp Filler and Liquid Extractor.

Donathen Novelty Mfg. Company, 510 Broadway, Kansas City, Mo., are introducing the above article, as illustrated herewith. The cork is made of rubber, graduated, and slides up and down on the main tube, so as to fit any sized opening or depth, from a 1 quart to a 5-gallon can. It is recommended by the makers for filling gasoline stoves, lamps, &c., from a can without spilling a drop; also for forcing liquid out of bottles, jugs or demijohns. The design of the device is to provide at a small expense an arrangement that will make old cans as serviceable as expensive pumping cans. The article is made in two sizes—No. 2 for 2-gallon cans, and No. 5 for 5-gallon cans.



Universal Lamp Filler and Liquid Extractor.

The Double Diamond Frame Planet.

The Parry Mfg. Company, Indianapolis, Ind., have added to their line of buggies, surries, spring wagons, &c., the manufacture of high-grade bicycles, as shown in the accompanying cut. The frame is referred to as a strong feature of originality, and as being constructed on the most scientific principles, thus securing great strength for weight of material employed. It is explained that at all points where the tubing is inserted into the forgings the depth is ample to guarantee the joint not to give way. The wheels are described as being made strong and light, with tangent spokes secured to the rim by special bronze nipples. In the hubs are detachable bearing cases, hardened and ground to size. The wheels are 30 inches front and rear, with 36 spokes to the front wheel and 40 to the rear, of specially drawn steel wire, No. 12 gauge at each end and reduced between to No. 14 gauge on special needle machinery. The machines are geared regularly to 54 inches, but 57 and 60 will be supplied to order. The full roadster weighs 45 pounds all on, or 42 pounds stripped.

The Double Diamond Frame Planet.

The new immigration law being in full effect, the foreign steamships arriving have their steerage filled with alien passengers, as usual in the spring months. One calculation is that 10,000 Italians are now *en route* and 13,000 Germans, besides the assortment from other parts. By starting early they avoid possible difficulties later in the season, when vessels are liable to detention at quarantine.

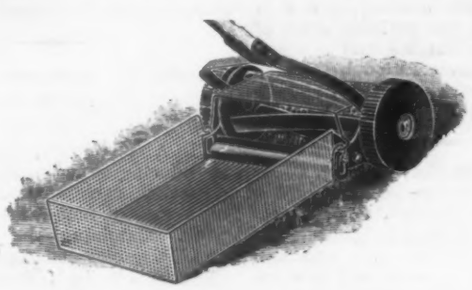
Rivetless Scale Pocket Knife.

Pauls Brothers, 88 Chambers street, New York, are introducing these goods, as illustrated herewith. The scales and the bolsters are described as composed of one solid mass, and riveted to the handle by strong rivets passing through the bolsters and blades, thus holding the blades, linings and handle together, and doing away with the necessity of the usual rivets through the scales to hold them in place. The manufacturers claim that the material used for making the scales—in imitation of shell, iveroid, hard rubber and stag—is a composition very strong, and they warrant them not to come off, break, or soil. They further state that the handle will look clean and neat as long as the knife lasts. The point is made that scales of knives put on in the usual manner crack from the rivet holes, showing that the rivets weaken the scales; and in such knives the lining is the only support for holding the knife together, the scales and bolsters forming the outer part of the handle being in no way connected, because where the bolster begins the scale ends.

Rivetless Scale Pocket Knife.

Bell's Improved Lawn-Mower Attachment.

The device for receiving and collecting cut grass, as herewith shown, is offered by John W. Bell & Co., Mercer, Pa. The receptacle is an oblong basket, made of wire and wire netting, all galvanized, with the rear end closed and the end next the machine open. The bottom of the basket is made of parallel wires running lengthwise, with spaces between them. A wire netting guard, to prevent the grass clippings from spreading, and an adjustable connecting rod, which is attached to the mower, and on which the basket is hooked, completes the attachment. It is stated that the device has recently been improved so that it can be attached quickly and easily to any ordinary roller



Bell's Improved Lawn-Mower Attachment.

mower without removing the roller or any other part of the mower, and that the width of the receptacle has been increased, and is now attached outside the frame of the mower. The manner in which the attachment fills and packs the grass is described as follows: The basket fills first at the end furthest from the mower and cannot possibly clog or choke the mower until the basket is full. The onward movement of the basket, the open space, slatted bottom, and the protruding stubble accomplish in the most simple manner what machinery could not be made to do. The manufacturers claim that it can be attached to any standard lawn mower in five minutes; that it is light and adds but little to draft of mower; that it is durable, and that it is quickly and easily emptied by picking it up, emptying wherever desired and setting it back on the mower.

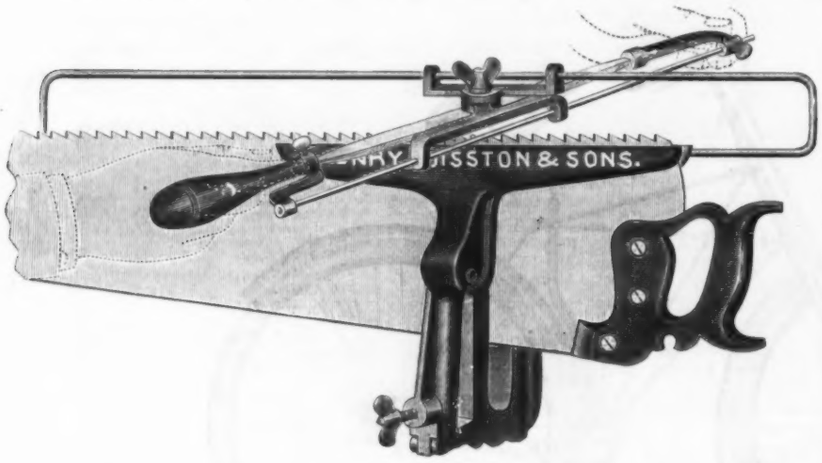


Fig. 1.—Saw Filing Attachment.

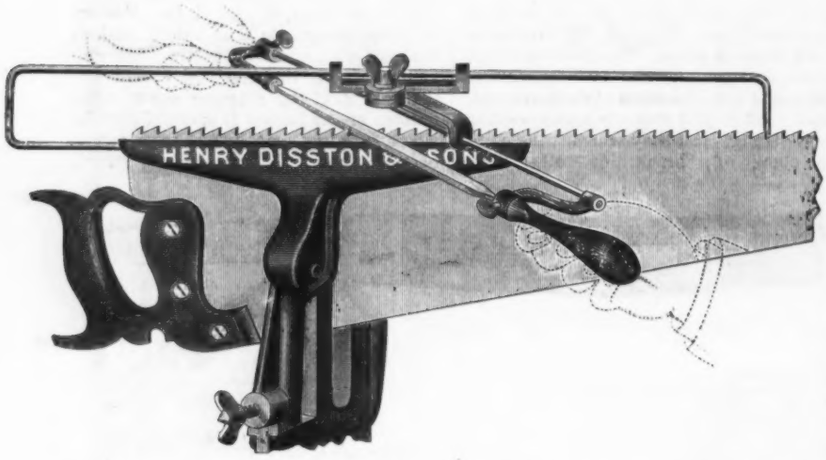


Fig. 2.—Attachment Reversed to File Other Side.

Interesting Advertising.

A Liverpool, England, firm of coal dealers have a novelty in the shape of an advertising folder; and although similar in form to those used by some concerns in this country it is more extended and differently worded from any that have come to our notice. It is a strip of colored paper folded in size to about 2½ inches square. Each fold as it is opened reveals on the successive pages the following inscriptions: "Look inside." "Where?" "Keep on." "What can it be?" "It's worth knowning." "How can I increase my income?" "Just what I want to know." "Tell me." "Gladly." "Save needless expenditure!" "How?" "Can I?" "Yes." "Twenty per cent. at least!" "How strange." "Is it a fact?" "Never forget it!" "What do you pay for coal?" "Ponder this." "You can save, by paying cash, 20 per cent. at least." "This is a special offer for cash only." Following the foregoing at the end of the folder, occupying the space of two folds, is the firm's offer, giving the price for cash at which they will deliver coal. One is not apt to forget the advertisement after the persistent effort required to arrive at it.

Woodbury's Automatic Cycle Chain Lubricator

M. A. Woodbury, Bradford, Pa., is introducing an automatic lubricator and duster for cycle chains. This consists of a sack 6 inches long and ¾ inch wide, containing the lubricant, the sack being clamped to a light steel arm. The arm is to be fastened by a clamp band to one of the lower rear forks which runs parallel to the chain, at a point about 3½ inches from the rear of the sprocket wheel, or just so that the wheel will not catch the sack, and above the lower chain. The arm is adjusted so that the sack will lie upon the chain. The maker claims that with the lubricator and duster the average cyclist's chain will run very easy with little wear and with little accumulation of dust inside or out. With each attachment three sacks are packed; sacks are also put up in packages of six, with no attachment.

Standard Door Holder.

E. J. Hussey & Co., 80 John street, New York, are introducing the holder, as illustrated in Fig. 1. It consists of a movable piece, in the lower end of which is a rubber foot, the piece being thrown up or down by means of an eccentric lever. The movable piece rides upon a base which is fastened to the door near the floor. The holder is attached, as in Fig. 2, with the rubber foot about ½ inch above the bottom of the door. In operation the lever is turned over and pressed down firmly with the foot, as in Fig. 3. To release it the lever is thrown over with the foot. The holders are furnished in gold bronze and black finish, also polished and nickel plated.

Fig. 1.—Standard Door Holder.

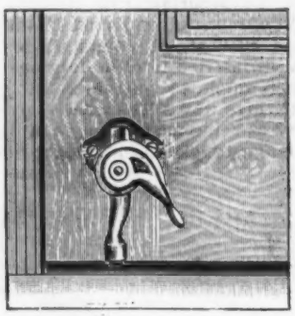


Fig. 2.—Door Holder Not in Use.

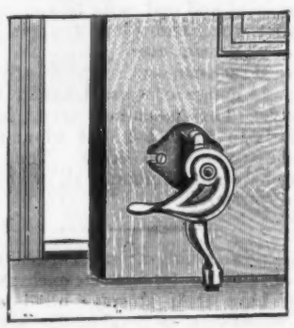


Fig. 3.—Door Holder in Use.

Current Hardware Prices.

MAY 17, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand..11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70%
Boring Machine Augers.....70%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E Jennings & Co., Auger Bits, ₩ set, 32¼ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $20; No. 2, $15.....35&40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass'.....33⅓@33⅓ &10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Shoulder Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.30

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00	$7.50
First qual., other brands	6.50 / 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼@3¼¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½% } 3% cash
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
National Tubular Self Oiling.....33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances..... 50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¼-in., $1.80; 12-inch, $2.00; 13¼-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)...₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)...₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connell's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous

Call.....45@50%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@10@75&5%
Standard.....70&5@70&10%
Extra.....60&10@60&10&5%
N.Y.B.&P. Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron..50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks....25%

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84.....80&5@80&10%
Eagle, Norway, list Oct. '84&80&10@80&15
Phila. pattern, list Oct. 7, '84.....80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's.....60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84..80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....3½¢

Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 30, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford s..50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting.	Inch	9	10	9x11
	Per doz.	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—

Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butcher's*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....80%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@55%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned..
Loose Pin, Acorns, Japanned, Plated Tips.....
} 75@75 &10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
} List Jan. 2 1893. 60@10&10%
Bronzed Wrought Butts.....50&10&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $2.10; 8-gal., $3.10; 10-gal., $3.35 each.....25%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co.....₩ 1000
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket, Waterproof, 1-10's.....50&10%
G. D.....37@39¢
S. B. Genuine Imported.....45¢
Eley's E. B.....50@55¢
Eley's D Waterproof, Central Fire..$1.00

Primers—

Berdan Primers, $1.00.....25
B. L. Caps (Sturtevant Shells) $1.00....25
All other Primers, $1.20.....25

Cards—

Watson's Cotton, Wool, Horse and File, list January 23, 1891.....85%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....25
Blank Cartridges, 32 cal., $3.50.....25
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....25
B. B. Caps, Con. Ball, Swgd., $2.00.....25

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed.....
Plate.....
Shallow Socket.....
} Brass.....55@55&10%
} Others.....60@60&10%
Deep Socket.....40&10%
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....40%
Yale, Gem.....70%
Giant Truck Casters.....25%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 8¢

Chain—

Trace, Wagon and Fancy Chains, List revised Oct. 15, 1892...60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add¼@½¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&2%
Covert Traces.....35&2%
Covert Heel Chains.....60&2%
Galvanized Pump Chain.
6-ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....90@60&10%
Jack Chain, Iron and Brass, list March 10, 1893.....50&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots.₩ gr 50¢, small lots.55¢
Red, case lots....₩ gr 67¢ small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—
Socket Framing and Firmer
P. S. & W. ..... 75&10@75&10&10%
New Haven ..... 75&10@75&10&10%
Witherby ..... 75&10@75&10&10%
Mix ..... 75&10@75&10&10%
Ohio Tool Co. ..... 75&10@75&10&10%
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@$5.00
Spear & Jackson's ..... $5 to $
Buck Bros. 30%
Cold Chisels, ₱ ℔ ..... 15@16¢

Chucks—
Beach Pat. ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Bals Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
R. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's ..... 75@75&5%
Carriage Makers', P., S. & W Co. ..40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps 33⅓%

Cleavers, Butchers'—
Bradley's ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros. 30%
Schulte, Loboff & Co. ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16 ... 65&5%
Superior Axle Clips ..... 60%&5@70%
Norway Spring Bar Clips, 5-16 ... 60&5&5%
Wrought Iron Felloe Clips ..... ₱ ℔, 5½¢
Steel Felloe Clips ..... ₱ ℔, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes 50%

Cocks Brass—
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company ..... 50&10@60%
Medford Fancy Goods Co. ..... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓@40%
Kohler's Magic Oscillating. ₱ doz., $2.00
Kohler's Humane ..... ₱ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 55%
Excelsior 50%
J. Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers ..... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.30; 3-gal., $2.60; 4-gal., $3 00; 6-gal., $3.75 each ... 33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—
Sash—
Common ..... ₱ ℔, 9@10¢
Patent, good quality ..... ₱ ℔, 11@12¢
White Cotton Braided, fair ... ₱ ℔, 24@25¢
Common Russia Sash ..... ₱ ℔, 12½@13¢
Patent Russia Sash ..... ₱ ℔, 13½@ 14¢
Cable Laid Italian Sash ..... ₱ ℔, 19@20¢
India Cable Laid Sash ..... ₱ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab. .30¢
Semper Idem, Braided, White. ... 27@28¢
Egyptian, India Hemp, Braided ..... 20¢
Massachusetts, White ..... 20¢
Samson—
Braided, White Cotton ..... ₱ ℔, 37¢
Braided, Drab Cotton ..... ₱ ℔, 42¢
Braided, Italian Hemp ..... ₱ ℔, 40¢
Braided, Linen ..... ₱ ℔, 56¢
Tate's Solid Braided—
Hercules, White ..... ₱ ℔, 25¢
Hercules, Drab ..... ₱ ℔, 30¢
Economy ,Drab ..... ₱ ℔, 27¢
Economy White ..... ₱ ℔ 22¢
Osgawan Mills—
Braided ,Giant, White, ₱ ℔, 30¢ ... 20%
Braided Giant, Drab and Fancy, ₱ ℔ 35¢ 10%
Braided, Crown White, ₱ ℔, 50¢ ... 50%
Braided, Crown Drab and Fancy, ₱ ℔ 50¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers, Nut—
Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ₱ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co. 50%
Acme.
Japanned, ₱ gro., $30 ..... 50%
Nickel Plated, ₱ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ₱ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₱ gross, $1.75 ..... 25%
Rolling Mill, ₱ gross, 2.50 ..... 25%
Railroad, ₱ gross, 2.00 ..... 25%
Soapstone Pencils, ₱ gross, 1.00 ..... 5%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—
Meat—
Dixon's, ₱ doz. ..... 40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's, ₱ doz. ..... 40&5%

Nos.		100	150
		$15.00	$18.00

Hale's Pattern, ₱ doz. 70%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise 25%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter .. 30@30&5%

Nos....	112	116	118	120	122
Each..	$2.00	$2.75	$3.00	$3.50	$4.00

Miles' Challenge, ₱ doz. ..... 45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ₱ doz., $26.00 ..... 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

Beef Shavers (Enterprise) 20%
Little Giant (P. S. & W. Co.) 50%
Chadborn's Smoked Beef Cutter, ₱ doz., $66.00

Tobacco
Champion ..... 20&10@30%
All Iron ..... ₱ doz., $4.25
Nashua Lock Co.'s.. ₱ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ₱ doz., $24.00, 55&10
Acme ..... ₱ doz., $20.00, 40%

Washer—
Smith's Pat. ... ₱ doz., $12.00, 20&10&10%
Johnson's ..... ₱ doz., $11.00, 33⅓%
Penny's.. ₱ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's ..... ₱ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Dampers, &c.—
Dampers, Buffalo ..... 40&10%
Buffalo Damper Clips ..... 40&10%
Crown Damper 40%
Excelsior ..... 40&10%

Diggers, Post Hole, &c.—
Samson, ₱ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ₱ doz., $36.00, 20@20&10%
Eureka Diggers ..... ₱ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₱ doz., $8.50@$9.50
Kohler's Little Giant ..... ₱ doz., $18.00
Kohler's Hercules ..... ₱ doz., $14.00
Kohler's Invincible ..... ₱ doz., $12.00
Kohler's New Champion .... ₱ doz., $8.00
Scheidler ..... ₱ doz., $18.00
Cronk's Post Bars, ₱ doz., $60.00, 50&5&50&10%
Gibb's Post Hole Digger ..... ₱ doz., $15.00
Gibbs' National ..... ₱ doz., $12.00
Gibbs' Columbia ..... ₱ doz., $13.00
Gibbs' Imperial ..... ₱ doz., $7.50
Shimer's Hollow Handle.. ₱ doz., $24.00, 50%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ₱ doz. ..... $18@$30

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's .... each $2.50, 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action .... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B. ..... 50&10&10%
Graham's Pat. Groove Shank. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 50&10&10%
Syracuse (Meta list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co. ..... 20@20&10%
Disston's 50%
Buck Bros. 30%
Stanley R. & L. Co.'s
No. 64, Varnished Hardles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 60%&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal ... 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat. ..... 30@33⅓%
Crawford's Adjustable 30%
Ellrich's Socket and Ratchet.. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense.. ₱ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits .... 30&30&5%
Screw Driver Bits ..... ₱ doz., 50@75¢
Screw Driver Bits, Parr's.. ₱ gross, $6.25
Fray's Hol. H'dle Sets ... No. 3, $12.00, 45%
P. D. & Co.'s All Steel 50%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits .... 27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co. ... 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.F.
Kegs, ₱ ℔	4½¢	5¢	2½¢
¼ kegs, ₱ ℔	4½¢	5½¢	2½¢
⅛ kegs, ₱ ℔	5¢	5½¢	3¢
10-₱ cans, 10 in case	6¢	6½¢	5¢
10-℔ cans, less than 10	10¢	10¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock ... Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₱ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ₱ gr.. 60&10%
Van Sand's Old Pat., $15 ₱ gr. ... 55&10%
Austin & Eddy No. 2008 ..... ₱ gr., $9.00
Security Gravity ..... ₱ gr., $9.00
Zimmerman's ..... 50&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key .. 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list.. 60%
Metallic Key, Leather Lined .. 60&10@60&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots .... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined.. 50%
No Brand, Red Cedar (in bbls.).. 50&10%
Western Pattern Metal Key 60%
No Brand Metal Key 60%
Self Measuring
Enterprise, ₱ doz., $36.00 ..... 20%
Lane's ₱ doz., $36.00 ..... 25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c. 60&10&5@60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds) .... 75% (extra prices on certain sizes.)
American ..... 66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands.. 60&10&5@70%
Fair brands ..... 70@70&10%
Second quality ..... 75@75&10&5%
Heller's Horse Rasps ..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut ... 50&10%
Arcade Horse Rasps .... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's list, 20%
Stubs ..... Stubs list, 25&30%

Fixtures, Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co. ..... 50&10%
P., S. & W. Co. ..... 50&10%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List. 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&3%
Plated, see Spoons.

Frames—
Saw—
White Vermont ..... ₱ gro., $9.00@$10.00
Red, Polished and Varnished.... ₱ doz., $1.50, 25%
Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons ... 33⅓@33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames ..... 50&10&5%
Bonanza Window Screens. 50&5@50&10%
Empire Fancy Screen Doors, ₱ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 55%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero ..... 60&10&10%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50 .... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Expert ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe: Tin, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro. 30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz. 25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½@15%. ₱ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—
Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20@20%
Boss, ₱ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c. ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Barrett's Comb. Roller Gauge ..... ₱ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ₱ doz., $5.00
Without Scale ..... ₱ doz., $4.00
Wire, Wheeler, Madden & Co. 10%
Wire, Morse's 35%
Wire, Brown & Sharpe's ..... 10@30%
Wire, P., S. & W. Co. ..... 10&10%

Gimlets—
Nail and Spike ..... 60&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ₱ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 35@35&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes ..... ₱ gr $9.50
Dixon's Everlasting, in bxs., ₱ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting ... 10-℔ pails, ea. 85¢
Lower grades, special brands, ₱ gr $5.50@$7.00
Axleine, tin boxes ..... ₱ gross $12.00
English Coach, wooden boxes ..... ₱ gross $8.50
English Coach, 5-℔ tin pails. ₱ doz. $8.50
Tiger, wooden boxes ..... ₱ gross $7.00
Tiger, 5-℔ tin pails ..... ₱ doz $2.85

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co. 30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₱ gr. $1.75
Pat. Sewing, Short. ₱ doz. ..... 45@50%
Pat. Sewing, Long ..... ₱ doz $1.20
Pat. Peg, Plain Top. ₱ doz. ..... 40@45%
Pat Peg, Leather Top. ₱ doz ..... @50%

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓%
Covert's Saddlery Works Horse and Cattle Ties... .....33⅓%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@33⅓%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree..... ....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ ℔40¢ } 75&10@75&10 &5%
8 to 5 ℔.....℔ ℔36¢ }
Over 5 ℔.....℔ ℔30¢ }
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Boggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ dos 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70&70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd.℔ gr 4.50
Hickory Firmer Chisel, large.℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00
Auger, large.....℔ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati, Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's..... 40 & 10 @ 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schultz, Loboff & Co .....5@50&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 2, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13..75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz...$5.60, 60@60&10%
Clark's, Nos. 1 ,2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking 15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....60%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60& ¼%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro , $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10....℔ gross $13.00
New Idea Dbl. Acting.....40%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap. { 6 to 12 in., ℔ ℔... 4¢ ; 14 to 20 in., ℔ ℔...3½¢ ; 22 to 36 in., ℔ ℔... 3¢
Screw Hook and Eye.... { ⅛ in., ℔ ℔ 7½¢ ; ¼ in., ℔ ℔ 5½¢ ; ⅜ in., ℔ ℔ 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges ("Providence") { 8, 10 & 12 in., ℔ ℔.....5¢ ; over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....30%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 70@70& 5%
Am. Axe and Tool Co., S. & O. Pat.....
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Bals Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size.. ..40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.... } 60&10&10%
Bird Cage, Reading .....
Clothes Line, Sargent's list
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples, Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....35%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass,No.2, $2.00; No.3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition.....75@75&10&5%
Standard.....60&10&10@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee.....50&10@60%

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Enterprise Irons, list Jan. 17, 1893....30%
Enterprise Star Irons, list Jan. 17, '93..30%
Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers .....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%
Tinker's Dread. ℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15&20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby..... }
P., S. & W..... } ...75@75&10&5%
Mix..... }
New Haven..... }
Merrill.....60&10@60&10&5%
Douglass.....75&75@5%
Watrous .....1&10@25%
L. & I. J. White.....30&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$3.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.. .....℔ doz. $7.00@$8.00%

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ dos. $3.00, 33⅓%

Knobs—

Door, Mineral .....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l.....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1895...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&15%
Carriage, Jap .....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard..℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¼-inch regular.....℔ doz $2.60
3-inch regular.....℔ doz $3.90
2¼-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....35%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 10 20 100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50...30%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '94, rev. Jan. 1, '95.33⅓&2%
Delta, Nos. 36 to 39.....40%
Delta, Nos. 51 to 63.....40&10%
Delta, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓%
Yale.....net pric
Romer's.....25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... } 65&10@70% Much
Mallory, Wheeler & Co., list July, '93..... } lower net
Sargent & Co., List Aug.1,'93 } prices
Branford Lock Works ... } after

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40&40&10%
Yale.....net prices
Delta Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof.₱ doz. $8.00, 50%

Padlocks—

List June'10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Delts.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₱ doz $9, 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50&5%
No. 61 line.....60&5%
No. 21 line.....75&10%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₱ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated. ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Lieseche's pat.), No. 100, ₱ gr., $8; No. 105, ₱ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat...	5.50	6.75	40&10&10%
Jennings'.	5.50	6.75	45&45&10%
Other Machines	2.35	2.75	
Phillips' Patent with Augur.	7.00	7.50	
Miller's Falls	7.50		25%

Fluting—

Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Rolls, $2.15.....35%
Eagle, 5¼-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₱ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₱ doz $8.00.....40%
Combined Fluter and Sad Iron. ₱ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Differential Pulley Block.....40%
Energy's Mfg. Co.'s.....25%
Pure Grip Steel Tackle Blocks.....25%

Washing—

Anthony Wayne, ₱ doz., No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₱ doz $36.00
Western Star ₱ doz, No. 2, $36; No. 3 $30.
Weisell.....₱ doz $54.00
Fair and Square.....₱ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list. $
60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck' ₱ dozen, $3.50; ¼-peck, $3.00.

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$3.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List Jan. 1, 1888.60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6
Low-Grade Machines:
10-in. $3; 12-in., $3.25 14-in., $3 50 each

Muzzles—

Safety.....₱ doz., $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	85%	85%	85%	85%	85%	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&10&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	30&10%
Essex	28¢	26¢	25¢	24¢	23¢	40&10&5@50&5%
Lyra	19¢	17¢	16¢	15¢	14¢	40&10%
Snowden	19¢	17¢	16¢	15¢	14¢	40&10%
Vulcan	23¢	21¢	20¢	19¢	18¢	25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	23¢	21¢	20¢	19¢	18¢	40&5%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell.	19¢	18¢	17¢	16¢	16¢	10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronsed					13@14	₱ ᵬ

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ᵬ, add 1-10¢ ₱ ᵬ net; in packages less than 100 ᵬ, add ½¢ ₱ ᵬ, net.

Oakum—

Best or Government. .....₱ ᵬ 6¾@7¼¢
U. S. Navy.....₱ ᵬ 5¾@6¢
Navy.....₱ ᵬ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $2.75@$3.00
Duplex.....₱ doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4, French.....₱ doz $2.25, 55&60%
No. 5, Iron Handle.....₱ gr $6.00, 45&50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 65%@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00.....55&5%
Domestic, ₱ doz $2.00.....45%
Champion, ₱ doz $2.00.....50%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₱ ᵬ 80¢.....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₱ ᵬ
Russia Packing.....14¢ ₱ ᵬ
Italian Packing.....13¢@14¢ ₱ ᵬ
Cotton Packing.....15¢@17¢ ₱ ᵬ
Jute.....7¢@8¢ ₱ ᵬ

Pails—

Creamery—

B. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts 10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Heiwig's	2.50	2.75	3.00
Sidney Shepard & Co.	2.35	2.85	3.05
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₱ doz $4.20
Milk, 14 qt.....₱ doz $5.40
Stable, 14 qu.....₱ doz $6.00
Fire Pails, deep.....₱ doz $4.80
Fire Pails, round bottom.....₱ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₱ doz.	$3.60	$4.00
Dairy Pails, 14 qt., ₱ doz.	4.00	4.50
Fire Pails, No. 1, 12 qt., ₱ doz	4.00	
Fire Pails, No. 2, 14 qt., ₱ doz	4.50	
Sugar Pails.	5.50	6.00
Horse Pails.	4.50	
Buggy Pails.	3.50	
Slop Jars (bal. trap).	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₱ ᵬ 5½¢
Large sizes.....₱ ᵬ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....60%&

Dust—

Steel Edge, No. 1.....₱ doz $1.75

Roasting and Baking—

Columbia, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....50%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.....50&10@50&10&5%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₱ doz $4.75
Baldwin.....₱ doz 5.25
Bonanza.....each 5.00
Daisy.....₱ doz 4.00
Dandy.....each 7.50
Eclipse.....₱ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State....₱ doz 27.00@30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6.00
Turn Table.....₱ doz 4.50
Victor.....₱ doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.00
72.....₱ doz 4.25
78.....₱ doz 7.00

Potato—

White Mountain.....₱ doz $4.50
Antrim Combination.....₱ doz $5.50
Hoosier.....₱ doz $13.50
Saratoga.....₱ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, #17 and #18.....60&10%
Peck, Stow & W. Co....50&10&50&10&25%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1¼ and over, Plain.....70&10%
1¼ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892.....55&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing...50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to $
Buck Bros.....30%
Auburn Thistle. } .....30&10%
Ohio. }
Sandusky }
L. & I. J. White.....25%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₱ ᵬ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₱ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....50&10@50%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels .....70&10@70&10&10%
Davis Iron Levels.....40&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....33⅓&5
Silver & Co., 6-Ring, ₱ doz, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₱ doz $6.00
Bishop's Monarch.....₱ doz $4.50
Bishop's Pioneer.....₱ doz $4.00
Bishop's American.....₱ doz $3.50
Eagle, Double Stale.....₱ doz $3.75
Eagle, Single Stale.....₱ doz $2.75
Buckeye, Single Stale.....₱ doz $2.75
Bolding .....₱ doz $6.00
Metallic Horse Poke.....₱ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....30%
Daley's Improved Handcuffs; 2 Hands, Polished, ₱ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₱ doz, $72.00; Nickeled, $84.00.....30%
J. P. Lovell's Police Goods.....30%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₱ gro, $6.00, 10%
Gem .....₱ gro, $4.50, 10%
Gold Medal..... .....₱ gro, $6.00, 25%
Lustro.....₱ gro, $4.75
Ruby.....₱ gro, $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ᵬ 2¢
Boynton's Noon Day.....₱ gro $13.00
Parlor Pride Stove Enamel, ₱ gro
Yates' Liquid, 2 3 5 10 gal
₱ gal.. .$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ᵬ cans, ₱ ᵬ 13½¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $3.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish, ₱ gro $9.00
Bonnell's Paste Stove Polish, ₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ᵬ cans.....15%¢
Black Jack Water Paste, 5 and 10 ᵬ cans.....13½¢
Nickel Plate Paste.....₱ gro $6.00
Crown Paste.....₱ gro $7.20
Crown Paste in 5 and 10 ᵬ pails, ₱ ᵬ 12¢
Black Flag.....₱ gro $7.20
Black Flag, 5 and 10 ᵬ pails.....₱ ᵬ 12¢
Black Flag, liquid, in bottles, ₱ gro $8.00
Diamond Rock Nickel Cleaner.....₱ gro $10.80
Raven Paste.
5-lb. pails, (per case of 6 or 12), ₱ ᵬ 12¢
Less than case.....₱ ᵬ 15¢
Liquid, 6 oz. bottles.....₱ gross, $3.00
Liquid, 8 oz. bottles.....₱ gross, $2.00
Water Polish.....₱ gross, $5.85

Poppers, Corn—

Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@$15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ᵬ each	$0.20
Duck, 1 ᵬ each	.20
Rifle, 1 ᵬ each	.20
Rifle, ½ ᵬ each	.13
Rifle, ¼ ᵬ each	.13

In Kegs—

Rifle, 25-ᵬ kegs	$4.00
Rifle, 12½-ᵬ kegs	2.00
Rifle, 6¼-ᵬ kegs	1.25
Duck, 25-ᵬ kegs	5.00
Duck, 12½-ᵬ kegs	2.75
Duck 6¼ ᵬ ▸ ▸ ▸	1.50

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. 25%
Henis ..... ₩ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Scranton ..... ₩ doz., $18.00, 33⅓&5%
Curtis Hammer ..... ₩ doz., $9.00
Giant, No. 1 ..... ₩ doz., $18.00, 10%
Giant, No. 2 ..... ₩ doz., $15.00, 10%
Pelican ..... ₩ doz., $9.00, 25%
Eclipse ..... Each, $2.00, net
Economy ..... ₩ doz., $6.00

Pulleys—

Hot House, Awning, &c. ..... 66⅔&70%
Japanned Screw ..... 60&10&10%
Brass Screw 70%
Japanned Side ..... 60&10&10%
Japanned Clothes Line ..... 60&10%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70 ..... 50%
Hay Fork, "F" Common and Patent Bushed 20%
Hay Fork, Tarrox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks—See Blocks.
Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00 ..... 40%
Shepard's Niagara, No. 25..₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense 60%
Empire 60%
Ideal, Nos. 2, 4, 10 & 15 / Acme / Star } 30% less 1¢ ₩ doz net.
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. .. ₩ doz. 22¢ net.

Pumps—

Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring ..... 50&5%
Bemis & Call Co.'s Check 55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44 ..... 55%
Tinners' Hollow Punches, P., S. & W Co. ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches ..... 20&2%
Niagara Solid Punches 55%

Rail—

Sliding Door, Wr't Brass..₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..₩ ft., 7¢
Sliding Door, Iron, Painted..₩ ft., 4¢, 40%
Barn Door, Light..in. ¼ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet ..... $3.15 2.70 3.25 Net
Terry's Steel Rail ..... ₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot ..... 50&2%
Carrier, double braced, Steel Rail, ₩ foot ..... 5½@4¢
Moore's Wrought Iron 25%
Moody Steel Rail ₩ ft., 5¢ 45%

Rakes—

Cast Steel, Association q'ds..70@70&5&2%
Cast Steel, outside g'ds ..... 70@70&5&2%
Malleable ..... 70@70&5%
Gibbs' Lawn Rake ..... ₩ doz., $4.90
Gibbs' Canton Lawn Rake..₩ doz., $3.75
Gibbs' Acme Lawn Rake..₩ doz., $4.75
Gibbs' Favorite Lawn Rake.₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1 ..... ₩ doz., $4.90; No. 2, $3.40
Oneida Lawn Rake ..... ₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—

J. R. Torrey Razor Co 20%
Wostenholm and Butcher, $10 to £.... 10%
Jordan's AAA1, new list ..... Net
Jordan's Old Faithful, new list ..... Net
Galvanic ..... ₩ doz., $15.00
Electric Cutlery Co ..... Net
Campbell Cutlery Co. 50%

Razor Strops—

See *Strops, Razor.*

Rings and Ringers—

Bull Rings—

Union Nut Co. 55%
Sargent's ..... 75&10%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co.'s..50&10&50&10&10%
Ulrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers..₩ doz $2.00
Top of the Hill Rings..₩ doz $1.25
Hill's Improved Ringers..₩ doz $1.25
Hill's Old Style Ringers..₩ doz $1.12½
Hill's Tongs ..... ₩ doz $3.00
Hill's Rings ..... ₩ doz bxs $1.00
Perfect Rings ..... ₩ doz bxs $1.50
Perfect Ringers ..... ₩ doz $2.15@$2.25
Blair's Hog Ringers ..... ₩ doz $2.00
Blair's Hog Rings ..... ₩ doz 90¢@$1.00
Champion Ringers ..... ₩ doz $2.00
Champion Rings, Double ..... ₩ doz $2.25
Brown's Ringers ..... ₩ doz $2.00
Brown's Rings ..... ₩ doz $1.15@$1.25
Electric Hog Rings ..... ₩ doz boxes $1.50
Electric Hog Ringers ..... ₩ doz $2.00
Major Rings ..... ₩ doz $1.25
Major Ringers ..... ₩ doz $2.00

Rivets and Burrs—

Iron, list Nov. 17, '87 ..... 60&10@—%
Copper ..... 60@60&10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Brass ..... 25@30%
Stair, Black Walnut ..... ₩ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller... ..... 70%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ½¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger ₩ ℔ 9½¢
Manila ..... ⅝ in. ₩ ℔ 10 ¢
Manila ..... ¼ and 5-16 in. ₩ ℔ 10½¢
Manila, Tarred Rope ..... ₩ ℔ 9 ¢
Manila, Hay Rope ..... ₩ ℔ 9 ¢
Sisal ..... 7-16 inch and larger ₩ ℔ 7½¢
Sisal ..... ⅝ in. ₩ ℔ 8½¢
Sisal ..... ¼ and 5-16 in. ₩ ℔ 8½¢
Sisal, Hay Rope ..... ₩ ℔ 7½¢
Sisal, Tarred Rope ..... ₩ ℔ 7½¢
Sisal, Medium Lath Yarn ..... ₩ ℔ 7½¢
New Zealand..7-16 in. & larger ₩ ℔ 7½¢
New Zealand ..... ⅝ inch, ₩ ℔ 7½¢
New Zealand, ¼ and 5-16 inch, ₩ ℔ 8½¢
New Zealand, Hay Rope ..... ₩ ℔ 7½¢
New Zealand, Tarred Rope ..... ₩ ℔ 6½¢
Cotton Rope ..... ₩ ℔ 13½@16¢
Jute Rope ..... ₩ ℔ 6½@7¢

Wire—

List February, 1892. All kinds 45%

Rules—

Boxwood ..... $0&10&10%
Ivory ..... 50&10%
Starrett's Steel Rules and Straight Edges ..... 25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—The following prices are generally cut by jobbers.

Disston's Circular ..... 45@45&5%
Disston's Cross Cut, list Jan. 1, '93..40&10%
Disston's Hand 25%
Woodrough & McParlin.
Hand, Panel and Rip ..... 25&10%
Cross Cuts, list Jan. 1, 1893 ..... 45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip ..... 40&10%
Cross Cuts, list Jan. 1, 1893 ..... 45&10%
Atkins' Circular 50%
Atkins' Cross Cuts, new list. 40@40&10%
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw 40%
Peace Circular and Mill ..... 45@45&5%
Peace Hand Panel and Rip ..... 25@25&5%
Peace Cross Cuts, list Jan. 1, '93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1, '93.45&10%
Richardson's Hand, &c ..... 25@25&5%
C. E. Jennings & Co.'s brand. 25%

Hack Saws—

Griffin's, complete ..... 40&10&50
Griffin's Hack Saw Blades ..... 40&10&50
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—

Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cab Makers' 15,25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161..₩ doz $6.50@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10
Richle Bros.' Platform 40%

Scale Beams—See *Beams, Scale.*

Scissors, Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00 ..... 30&10%
Box, 1 Handle ..... ₩ doz $2.25@$2.50
Box, 2 Handle ..... ₩ doz $3.00@$3.25
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10&60%
Ship, Common ..... ₩ doz $3.50 net
Ship, R. I. Tool Co. 10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₩ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Hand, Grand Rapids, list 35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890 ..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 80@80&5%
Hand Rail, Sargent's ..... 70&10%
Hand Rail, H. & B. Mfg. Co. ..... 70&10@75%
Hand Rail, Am. Screw Co. 75%

Jack Screws—

Jack Screws, Millers Falls list..50@50&10%
Jack Screws, P., S. & W 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns' ..... 40@40&10%

Cork—

Humason & Beckley Mfg. Co. ..40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Detroit Cork Screw Co. 33⅓%

Machine—

Flat Head Iron 65%
Round Head Iron 60%

Wood—

List January 1, 1891.
Flat Head Iron 70%
Round Head Iron 65%
Flat Head Brass 70%
Round Head Brass 65%
Flat Head Bronze 70%
Round Head, Bronze 65%
} Extra 10 or 10& often given.
Rogers' Drive Screws 83⅓%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain ..... 40&5@40&10%
Grass ..... 40&10&50%

Scythe Snaths—See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 ..... 60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ..... 45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18 ..... 35%
Henry's Combination Haft..₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—

Square ..... ₩ gr. $4.00@$4.25
Round ..... ₩ gr. $3.25
Buck Bros. 27½%
Cannon's Diamond Point..₩ gr. $12, 20%

Rivet—

Regular list 70%

Saw—

Stillman's Genuine..₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $5.25 ..... 55%
Common Lever ..... ₩ doz $2.00, 45@50%
Morrill's No. 1, $14.00 ..... 40@20%
No. 11, $15.50 ..... 40@20%
Nos. 3 and 4, Cross Cut, $22.50..40@20%
No. 5, Mill, $30.00 ..... 40@20%
No. 10, $15.00 ..... 40@20%
Leach's..No. 0, $8.00; No. 1, $15..15@20%
Nash's ..... 20@10@20&10&10
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 45%
Bemis & Call spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 30%
Bemis & Call Co.'s Cross Cut ..... 30&5%
Aiken's Genuine ..... $13.00, 50&10@50%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold ..... 40&10@50%
Atkin's Lever ..... ₩ doz No. 1, $6.00
Atkin's Criterion ..... ₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Kohler's Royal ..... ₩ doz $7.00
Kohler's Giant Royal ..... ₩ doz $12.00
Crescent ..... ₩ doz $3.00
Lloyd's Acme ..... ₩ doz $15, 40&10%
Taintor Positive ..... ₩ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles..₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%
Goodell's ₩ doz. $9.00 ..... 25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears 33⅓%
Cast Steel Trimmers:
First quality ..... 80@80&10%
Second quality ..... 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Hatch Cutlery Co., Solid Steel Forged..60%
Davenport Cutlery Co. ..... 60@60&10%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list..60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated 65%

Tinners' Snips—

Wrt. Handles, Steel Blades . 20@20&10%
Niagara Snips and Shears ..... 20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hooks—

Diston's Combined Pruning Hook and Saw ..... ₩ doz. $18.00, 20&10%
Diston's Pruning Hook, ₩ doz. $12.00 ..... 20&10%
E.S. Lee & Co.'s Pruning Tools..50&10&70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.50
Wheeler, M. & C. Co., Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 20%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co. 60%
Levin Pruner No. 1, $15.00 ₩ doz ..40&2%
Levin Pruner No. 2, $21.00 ₩ doz...40&2%

Tinners', &c.—

Shears and Snips (P. S. & W.) ..... 20&2%
Snips, J. Mallinson & Co. 33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888...50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&5%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—

R. & E., list Dec. 18, 1885 ..... 60&10&2%
Sargent's list 70%
Reading list ..... 60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge ..... 25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) ..... 20&10&2%
Prize ..... 40&2%
Star, Club, Rival and Climax Brands... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2%
Trap brand, 12 and 10 gauge..33⅓&10&2%
Selbold's Comb. Shot Shells ..... 15&2%
Brass Shot Shells, 1st quality ..... 60&2%
Brass Shot Shells, Club, Rival, Climax. ..... 60&2%

Shells, Loaded—

Standard List, July 19, 1890 ..... 40&10&10@40&10&10&2%

Ship Tools—

L. & I. J. White ..... 20&2%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phoenix, Standard, Diamond State and Bryden's Boss, at factory $4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox Wrought—

Ton lots ..... ₩ ℔ 0¢
1000 ℔ lots ..... ₩ ℔ 0½¢
500 ℔ lots ..... ₩ ℔ 1¢

Shot—

	Small lots.	
Drop, up to B, 25-℔ bag	$1.45	In ton lots a discount of 5¢ ₩ 100 (25 ℔) is made.
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&5%
Griffith's Solid C. S. R. R. Goods 30%
St. Louis Shovel Co. ..... 20@20&7½%
Hussey, Binns & Co. ..... 15@5%
Hubbard & Co. ..... 20@20&7½%
Lehigh Mfg. Co. ..... 50&10%
H. M. Myers Co. 50%
Payne Pettebone & Son ..... 33⅓&5%
Remington's (Lowman's Pat.) 40&10&50%
Rowland's Black Iron..60&10@50&10&5%
Rowland's Steel ..... 60&5@60&10%
Terra Haute Shovel & 35%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&2½%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&20%
Buffalo Metallic, S. S. & Co. ..... 50&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $18.00@$20.00
Electric ..... ₩ gr $17.00@$20.00
A. & W. Sifters ..... ₩ gr $18.00@$20.00
Hunter's ..... ₩ gr $18.00@$20.00

Sieves, Wooden Rim—

	Iron	Plated
Mesh 18, Nested, ₩ doz.	$0.80	$1.00
Mesh 20, Nested, ₩ doz.	.95	1.10
Mesh 24, Nested, ₩ doz.	1.15	1.35

Sinks, Wrought Steel—

Columbus, Painted or Unpainted ..... 30@30&10%
Columbus, Galvanized and Enameled. 50@50&10%
New Era, Painted ..... 40&10@50&5%
New Era, Galvanized and Enameled... 60&10&10@70&5%

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co. 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 30%

Slates—

School, by case ..... 50&10@50&10&10%

Sleds Hand—

Tubular Steel ..... ₩ doz $24.00 40&5%
Lots of 6 doz 50%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....55%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph.33⅓%
John Frots Snaps....75@75&5%

Snaths—

Scythe....50&2@50&5&2%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₱ doz., No. 5, $8; No. 8X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—

months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 40 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&5%
18% Rogers' German Silver....60&5%
12% Rogers' Nickel Silver....50&5%
German Silver....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in....₱ doz $1.20@1.2
Warner's No. 1, ₱ doz $1.50; No. 2, $3.40....55@55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Cowell's, No. 1, ₱ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₱ doz $4.50....55&10%
Swivelles....50@50&10%
Phœnix....33⅓%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—

Steel and Iron....
Nickel-Plated....} ..80&10&10@80&25%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares....25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—

Fodder—

Blair's....₱ doz $2.00
Blair's "Climax"....₱ doz $1.25

Lemon—

Porcelain Lined, No. 1....₱ doz $6.00....25&30%
Wood, No. 2....₱ doz $3.00, 35%
Wood, Common....₱ doz $1.70@1.75
Dunlap's Improved....₱ doz $3.75, 20%
Bammis...No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz....25&10%
Jennings' Star....₱ doz $2.50
The Boss....₱ doz $2.50
Dean's...Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Silver & Co., Glass....₱ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ½ in. and larger, ₱ lb 7@7½¢
Barbed Blind, ¾ in....₱ lb 8@8½¢
Fence Staples, Galvanized, Fence Staples Plain....} Same price as B'rb Wire See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....25@30%
Beece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....25@30%

Stops, Bench—

Morrill's, ₱ doz., Nos. 1, $9.50; 2, $12.00....40&20%
Hotchkiss's....₱ doz $5, 10&10&10%
Weston's, No. 1, $10 No. 2, $9, 25&10&5%
McGill's, ₱ doz $3....10%
Cincinnati....25&10%
Terrell's Nos. 1 and 2, ₱ doz., $3; No. 3, $3.60....30%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₱ lb....8¢
Sand Stone....5¢
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
} 40 @ 40& 10%
Lily White Washita....60¢
Rosy Red Washita....60¢
Washita Stone, Extra....80¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
} 33⅓@33⅓&10%
Lake Superior....₱ lb 13¢
Lake Superior Slips....₱ lb 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished....₱ doz $2.2
Cast Iron, Steel Points....₱ doz 75@80¢
Socket....₱ doz $1.75
Bullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ..₱ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₱ doz $2.00
Lamont Combination....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—

Miles' Challenge, ₱ doz $20....50@50&5%
Perry....₱ doz, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5....₱ doz $17.00
Bissell No. 8....₱ doz $20.00
Bissell, Grand....₱ doz $36.00
Standard....₱ doz $24.00
Domestic....₱ doz $21.00
Domestic, No. 2....₱ doz $22.00
Grand Rapids....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₱ doz $15.00
Improved Parlor Queen, Nickeled....₱ doz $27.00
Japanned....₱ doz $24.00
Excelsior....₱ doz $22.00
Garland....₱ doz $18.00
Parlor Queen....₱ doz $24.00
Housewife's Delight....₱ doz $15.00
Ladies' Friend....₱ doz $15.00
Ladies' Friend No. 2....₱ doz $16.00
Advance....₱ doz $18.00
Our Leader....₱ doz $19.00
Triumph....₱ doz $20.00
Goshen....₱ doz $21.00
Supreme....₱ doz $22.00
Easy....₱ doz $22.00
Gilt Edge....₱ doz $24.00
Acme....₱ doz $26.00
Imperial....₱ doz $26.00
Grand Republic....₱ doz $30.00
Banner....₱ doz $32.00
The Star....₱ doz $21.00
Reliable....₱ doz $22.00
The Rapid....₱ doz $22.00
Our Own....₱ doz $27.00
Model....₱ doz $27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....₱ doz $1.00
10 dozen in 6 months....₱ doz $2.00
25 dozen in 6 months....₱ doz $3.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co....30%

Swings—

Davies Lawn....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....60%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture Frame Points, S. S....35%
Finishing Nails....60%
Trunk and Clout Nails—
Blacked....62½%
Tinned or Coppered....66⅔%
Basket Nails....60%
Chair Nails....52½%
Cigar Box Nails....45%
Tin Capped Nails....50%

Extra discount 25&2%

Miscellaneous—

Double Point....90@90&10%
Wire Carpet Nails....50&10%
Claw Handle Carpet....₱ gross $4.00
Bonnie Blue....₱ box 1 50
Bill Nye Brad Box....4 00
Parisian Glit Nails, cartoon....50
Home Tacks, No. 50 ₱ case (12 cartons), $36.00; No. 100, ₱ case (12 cartons), $72.00
Home Nails, No. 200, ₱ case (12 cartons), $30.00; No. 400, ₱ case (12 cartons), $60.00
} 50&2%
Upholsterers' Nails....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each....50&10%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—

Ring Peavies, "Blue Line"..₱ doz $20.00
Ring Peavies, Common....₱ doz $18.00
Steel Socket Peavies....₱ doz $21.00
Mail. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "blue Line"....₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....₱ doz $18.00

Saw—

Atkins', new list....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₱ doz holes, 9@10¢
Mouse, Round Wire....₱ doz $1.50 10%
Mouse, Cage, Wire....₱ doz $2.50 10%
Mouse, Catch-'em-alive..₱ doz $2.50 15%
Mouse, Bonanza....₱ doz 0.90@$1.00
Rat, Decoy....₱ gr $10.00, 10%
Ideal....₱ gr $10.00
Cyclone....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 75¢; in full cases, ₱ doz. 60@65¢
Hotchkiss Imp. Rat Killer....₱ gro $18.50
Hotchkiss New Rat Killer....₱ gro $16.50
Schuyler's Rat Killer....₱ gro $15.00
Dandy....₱ doz., $1.75

Fly—

Harper, Champion or Paragon ₱ doz. $1.75
Balloon, Globe or Acme....₱ doz. $1.50

Triers—

Butter and Cheese....25%

Trimmers, Spoke—

Bonney's....₱ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'....₱ doz $9.00, 20%
Cincinnati....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering..25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ₱ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes. Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	25¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ⅛ ℔ Balls, 55@54¢
Chalk Line, Cotton, ⅛ ℔ Balls....25¢
Mason Line, Linen, ⅛ ℔ Balls....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)....15¢
3-Ply Hemp, 1 ℔ Balls....16@16½¢
3-Ply Hemp, 1½ ℔ Balls....15@15½¢
Cotton Wrapping, 5 Balls to ℔....15@16¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls....10¢
Wool....8½@8½¢
Paper....13@14¢
Cotton Mops, 6, 9, 12 and 15 ₱ to doz....12¢

Vises—

Solid Box....50&10@60%

Parallel—

Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....50%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....20@25%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10%
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓@35%
Hopkins'....₱ doz $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ₱ doz., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—

Phœnix Vises....33⅓%
Phœnix Hand Vises....₱ doz $5.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....25&10%
Enterprise Pipe Vises....each $3.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up.. 68¢
U.M.C.&W.R.A.—B. E., 9&10.. 82¢
U.M.C.&W.R.A.—B. E., 8....96¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A.—P. E., 9&10.. 1.50
U.M.C.&W.R.A.—P. E., 8.... 1.70
U.M.C.&W.R.A—P. E., 7.... 1.80
} Dis. 50&2%
Eley's B. E., 11 and larger....$1.70@$1.75
Eley's P. E., 12 to 20....3.00@ 3.25

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&10%
White Enameled Ware—
Maslin Kettles....70&10@75%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Rustless Hollow Ware....50@50&5%
Gray Enameled Ware—
Stove....50%
Maslin Kettles....60&60&10%
Boilers and Saucepans....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889....33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in....	$1.80	2 00
Wash-Basins, 12 in....	2.00	2.50
Keelers, 11½ in....		3.50
Cuspidors....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure....	3.50	
Half-peck Measure....	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₱ doz....$6.00
Basins, Ringed, ₱ doz., No. 2....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest....$2.55
Butter Bowls 16, 17 and 19-inch (3 pieces), ₱ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₱ set....$1.20
} 25&5%

See also Pails.

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co....
Rogers & Brother....
Hartford Silver Plate Co....
William Rogers Mfg. Co....
} 40&25&5%

Washers—

Size hole....5-16 ⅜ ½ ⅝ to 1⅜
Washers....5¼ 4½ 3½ 2¾
In lots less than 200 ℔, ₱ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron....₱ ℔ 3½¢
Steel....₱ ℔ 3½¢

Weights, Sash—

Solid Eyes....₱ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $2.00 10 in. $2.50 12 in $2.75

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center....	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	....	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.06.

Wire and Wire Goods—

Iron—

Market,
Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18, 75&5%
Galv., Nos. 0 to 18, 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18, .70@70&10%
} Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd, Nos. 16 to 18, 80%
Bright and Ann'd, Nos. 19 to 26, 80&5%
Br. and Ann'd, Nos. 27 to 36, 82½&5%
Tinned, 65&10%
} Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4½¢
Galvanized Fence.....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%

Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, 12 to 30, imported.....
60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire, Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50&3%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
} 75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg's Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe.....55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40&10%
Webster's Pat. Combination.....35%
Boardman's.....30%
Always Ready.....35&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1893 85&10@85&10&5

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.. per gal.	..	@	50
Linseed, City, boiled	..	@	53
Linseed, Western, raw		@	50
Lard, City, Extra Winter...	86	@	..
Lard, City, Prime	85	@	86
Lard, City, Extra No. 1	65	@	70
Lard, City, No. 1	55	@	..
Lard, Western, prime	85	@	..
Cotton-seed, Crude, prime	..	@	48
Cotton-seed, Crude, off grades	40	@	45
Cotton-seed, Summer Yellow, prime	51	@	52
Cotton-seed, Summer Yellow, off grades	45	@	50
Sperm, Crude	..	@	97½
Sperm, Natural Spring	..	@	..
Sperm, Bleached Spring	..	@	..
Sperm, Natural Winter	1.00	@	1.03
Sperm, Bleached Winter	1.05	@	1.08
Whale, Crude	..	@	..
Whale, Natural Winter	55	@	56
Whale, Bleached Winter	..	@	58
Whale, Extra Bleached	59	@	60
Sea Elephant, Bleached Winter	..	@	..
Menhaden, Crude, Sound	40	@	..
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed	42	@	43
Menhaden, Bleached W'ter	45	@	..
Menhaden, Extra Bleached	48	@	..
Tallow, City, prime	60	@	65
Tallow, Western, prime	..	@	60
Cocoanut, Ceylon	..	@	6
Cocoanut, Cochin	..	@	6¼
Cod, Domestic	38	@	40
Cod, Foreign	42	@	45
Red Elaine	44	@	46
Red Saponified	₩ ℔	@	5½
Bank	per gal	@	41
Straits	41	@	42
Olive, Italian, bbls	58	@	60
Neatsfoot, prime	75	@	80
Palm, prime, Lagos	₩ ℔	@	8¼

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test	per gal	7	@ 7½
Black, 29 gravity, 15 cold test		7½	@ 8
Black, 29 gravity, summer		6	@ 6¼
Cylinder, light, filtered		14	@ 16
Cylinder, dark, filtered		10	@ 13
Paraffine, 23½ @ 24 gravity		11	@ 12
Paraffine, 25 gravity		10	@ 11
Paraffine, 28 gravity		7½	@ 8
Paraffine, red		6½	@ 10½

Paints and Colors—

Barytes, Foreign, ℔ ton	$22.00	@	24.00
Barytes, Amer. floated	29.00	@	32.00
Barytes, Amer. No. 1	16.00	@	18.00
Barytes, Amer. No. 2	13.00	@	15.00
Barytes, Amer. No. 3	11.00	@	12.00
Blue, Celestial	₩ ℔	@	8
Blue, Chinese	40	@	50
Blue, Prussian	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish	½	@	1
Brown, Vandyke, Amer	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk	2.75	@	..
Carmine, No. 40, in boxes or barrels	2.85	@	..
Carmine, No. 40, in ounce bottles	3.75	@	..
Chalk, in bulk	₩ ton	2.40	@ 2.50
Chalk, in bbls.	₩ 100 ℔	33	@ 40
China Clay, English	₩ ton	13.00	@18.00
Cobalt Oxide, prep'd		9.00	@11.00
Cobalt Oxide, black, lots 100 ℔		1.90	@ ....
Cobalt Oxide, black, less 100 ℔		1.96	@ ....
Green, Paris, in bulk		10	@ 10½
Green, Paris, 170 @ 175 ℔ kegs		10½	@ 11
Green, Paris, small pack		12	@ 17
Green, Chrome, ordinary		6	@ 12
Green, Chrom'n, pure		22	@ 25
Lead, Eng., B.B. white		8½	@ 10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔		7	@ 7¼
Kegs, lots 500 ℔ to 5 tons		6¼	@ 6¾
Kegs, lots 5 tons to 12 tons		6¾	@ 6¾
Kegs, lots 12 tons and over		6¼	@ 6¾
Lead, White, in oil, 25 ℔ tin pails, add to keg price		..	@ ¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		..	@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price		..	@ 2¼
Lead, Red, bbls. and ½ bbls		6	@ 7
Lead, Red, kegs		6¼	@ 7¼
Litharge, kegs		6¼	@ 7¼
Litharge, bbls. and ½ bbls		6	@ 7

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rocheile	1.35	@	1½
Ocher, French Washed	1½	@	2½
Ocher, German Washed	1½	@	3
Ocher, American	½	@	1½
Orange Mineral, English	8½	@	9
Orange Mineral, French	10	@	10½
Orange Mineral, German	8½	@	9
Orange Mineral, American	8½	@	8¾
Paris White, English Cliff-stone	1.00	@	1.15
Paris White, American	65	@	75
Red, Indian, English	5½	@	7
Red, Indian, American	2	@	6½
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American ₩ 100 ℔	1.00	@	1.10
Red, Venetian, English	1.20	@	1.35
Sienna, Italian, Burnt and Powd. ₩ ℔	4	@	5
Sienna, Ital., Burnt Lumps	1½	@	3½
Sienna, Ital., Raw, Powd	4½	@	5½
Sienna, Ital., Raw, Lumps	1½	@	3½
Sienna, American, Raw	1½	@	1¾
Sienna, American, Burnt and Powdered	₩ ℔	1½	@ 1¾
Talc, French		..	@ 1½
Talc, American		1½	@ 1¾
Terra Alba, Fr'ch. ₩ 100 ℔	95	@	1.25
Terra Alba, English	70	@	80
Terra Alba, American No. 1	65	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Burnt and Powdered	₩ ℔	3½	@ 4
Umber, Turkey Bnt. Lm		2½	@ 3
Umber, Turkey, Raw and Powdered		3½	@ ....
Umber, Turkey, R'w Lumps		2½	@ 2¾
Umber, Turkey, Bnt. Amer		1½	@ 1½
Umber, Turkey, R'w Amer		1½	@ 1½
Yellow, Chrome		10	@ 25
Vermilion, American Lead		11½	@ 12
Vermilion, Quicks'er, bulk		57	@ ..
Vermilion, Quicks'er, bags		58	@ ..
Vermilion, Quicksilver sm'r pkgs		62	@ ..
Vermilion, English Import		85	@ 90
Vermilion, Imitation, Eng		8	@ 35
Vermilion, Trieste		90	@ 92½
Vermilion, Chinese		92½	@ 95
Whiting Common, ₩ 100 ℔		37½	@ 42½
Whiting Gilders'		45	@ 55

Zinc, American, dry	₩ ℔	4½	@ ..
Zinc, French, Red Seal		7½	@ .
Zinc, Frech, Green Seal		9	@ ..
Zinc, Frech, V. M. X		..	@ 7
Zinc, Antwerp, Red Seal		7½	@ ..
Zinc, Antwerp, Green Seal		7½	@ ..
Zinc, German, L. Z. O		6½	@ 7¼
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over		10½	@ 11¼
lots less than one ton		11	@ 11¼
Zinc, V. M. in Poppy Oil, Red Seal		..	@ ..
lots of 1 ton and over		10	@ 10¼
lots of less than 1 ton		10¼	@ 10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1% ; 25 bbls., 2% ; 50 bbls. 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort	25	@	30
Black, Drop, English	12	@	15
Black, Drop, Domestic	7	@	10
Black, Lampblack, Best	30	@	35
Black, Lampblack, Common	7	@	13
Black, Ivory	8	@	15
Blue, Chinese	35	@	40
Blue, Prussian	20	@	45
Blue, Ultramarine	12	@	18
Brown, Vandyke	7	@	12
Green, Chrome	8	@	12
Green, Paris	16	@	18¼
Sienna, Raw	7	@	14
Sienna, Burnt	7	@	14
Umber, Raw	7	@	10
Umber, Burnt	7	@	10

Putty—

In barrels and ½ bbls	.01½	@	.01¾
In tubs	.01¾	@	.01¾
In tin cans	.01¾	@	.02¼
In bladders	.01¾	@	.02½

Spirits Turpentine—

In regular bbls	31¼	@	31¼
In machine bbls	31¾	@	32

Glue—

Low Grade	₩ ℔	8	@ 10
Cabinet		12	@ 14
Medium White		13	@ 15
Extra White		17	@ 20
French		10	@ 22
English		10	@ 15
Irish		12	@ ..

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CURRENT METAL PRICES.

MAY 17, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: ¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in....	₩ lb 1.80 @ 1.90¢
Refined Iron: ¾ to 2 in. round and square. 1 to 4 in. x ⅜ to 1¼ in.... 4¼ to 6 in. x ⅜ to 1 in.	₩ lb 1.90 @ 2.00¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.10 @ 2.20¢
Rods—¾ and 11-16 round and sq.	₩ lb 2.00 @ 2.10¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price	₩ lb 3.00¢
Burden's "H. B. & S." Iron, base price	₩ lb 2.80¢
"Ulster"	₩ lb 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store—

	Per lb
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¼¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store—

Black—

Nos.	Common American.	B. G. Cleaned American.
10 to 16	₩ lb 2¾ @	3½¢
17 to 20	₩ lb 3 @	3½¢
21 to 24	₩ lb 3¼ @	3½¢
25 and 26	₩ lb 3⅜ @	3¾¢
27	₩ lb 3½ @	3⅝¢
28	₩ lb 3¾ @	4 ¢
American B. B	₩ lb 4¢ @ 4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ lb 12¢ @ 13¢
Patent Planished	₩ lb A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel	₩ lb, 8½¢

Galvanized.

Nos.	B. B.
10 to 16	₩ lb 4.20¢
17 to 22	₩ lb 4½¢
23 to 24	₩ lb 4¾¢
25 to 26	₩ lb 5 ¢
27	₩ lb 5¼¢
28	₩ lb 5½¢
29 to 30	₩ lb 6¼¢

English Steel from Store—

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " " Annealed	₩ lb 75 ¢
" "Titanic"	₩ lb 20 ¢

METALS—

Tin—

	Per lb
Banca, Pigs	22 ¢
Straits, Pigs	21¼¢
Straits in Bars	23 ¢

Tin Plates—

Duty: 2.2¢ ₩ lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality.

	Per box.
Melyn and Calland Grade. IC, 10 x14..	@ $6.50
" " " IC, 12 x12..	@ 6.75
" " " IC, 14 x20..	@ 6.50
" " " IC, 20 x28..	@ 13.00
" " " IX, 10 x14..	@ 8.50
" " " IX, 12 x12..	@ 8.75
" " " IX, 14 x20..	@ 8.50
" " " IX, 20 x28..	@ 17.00
" " " DC, 12½x17..	@ 6.00
" " " DX 12½x17..	@ 8.00
Allaway Grade IC, 10 x14..	@ 6.00
" " IC, 12 x12..	@ 6.25
" " IC, 14 x20..	@ 6.00
" " IC, 20 x28..	@ 12.00
" " IX, 10 x14..	@ 7.50
" " IX, 12 x12..	@ 7.75
" " IX, 14 x20..	@ 7.50
" " IX, 20 x28..	@ 15.00
" " DC, 12½x17..	@ 5.50
" " DX, 12½x17..	@ 7.00

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14, 14 x 20.. $5.50	@ $5.60
10 x 20..	@ 8.50
20 x 28.. 11.50	@ 12.00
IX, 10 x 14, 14 x 20..	@ 7.00
BV Grade.—IC, 10 x 14, 14 x 20..	@ 5.60

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC, 14 x 20	@ $5.65
20 x 28	@ 11.00
IX, 14 x 20	@ 6.40
20 x 28	@ 12.80
Abecarne Grade.—IC, 14 x 20	@ 5.55
20 x 28	@ 10.80
IX 14 x 20	@ 6 40
20 x 28	@ 12.80

Tin Boiler Plates—

IXX, 4x 26 112 sheets	@ $13.35
IXX, 14 x 28 112 sheets	@ 14.50
IXX, 14 x 31 112 sheets	@ 16.00

American Terne Plates.—Apollo.

IC, 14 x 20	$6.25
IC, 20 x 28	12.50
IX, 14 x 20	7.25
IX 20 x	14 50

Copper—

Duty: Pig, Bar and Ingot, 1½¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot—

Lake	@ 12 ¢
Ansonia grade Arizona	@ 11½¢
Ansonia grade Casting	@ 11 ¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15 % @ 25 %, according to size of order.

Not wider than	Not longer than	And longer than	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
			Weights per sq. foot and prices per pound.							
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	23	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Ov'r 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅝ inch diameter and over, per pound 22¢

Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ₩ lb advance over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ ₩ lb advance over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ₩ lb advance over prices of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.

All Polished Copper over 20 in. wide, 2¢ ₩ lb advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

	Per lb.
14 ounce to square foot and heavier	28¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter, 2¢ ₩ lb additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

15 % @ 25 % discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned	₩ lb 34¢, 15% @ 25%

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper—

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ lb
14 oz.	25¢ ₩ lb
12 oz.	27¢ ₩ lb

Seamless Brass Tubes—

July 6, 1892. Net.

O. G.	N. G.	⅜	¼	⅝	½	⅝	1	1¼
8-14	6-12	32	28	25	24	23	22	19
15	13	33	29	26	25	24	23	20
16	14	34	29	27	26	25	24	20
17	15	35	30	28	27	26	25	21
18	16	37	31	29	27	26	25	22
19	17	38	32	30	29	28	27	24
20	18-19	39	34	32	31	30	29	26
21	20	41	36	34	33	32	31	29
22	21	43	37	35	34	33	32	31
23	22	45	39	37	36	35	34	34
24	23	48	41	39	38	36	35	36
25	24	51	44	41	40	39	38	40

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional

Brazed Brass Tubing. (To No. 20 inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20, inclusive	45¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	30 @ ..%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2	in. 10	in. 12	in. 14	in. 16	in. 18	in. 20	in. 22
	10	12	14	16	18	20	22	24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24	in. 26	in. 28	in. 30	in. 32	in. 34	in. 36	in. 38	in. 40
	26	28	30	32	34	36	38	40	
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65	
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66	
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.75	

Discount from List 15 % to 25 %.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0.26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 and No. 20	.24	.26	.28	.32
No. 21, or 0.032 diameter	.25	.27	.29	.33

Discount 15 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0.26	$0.28	$0.30	$0.34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.62
No. 31	.51	.53	.55	.67
No. 32	.55	.57	.59	.73
No. 33	.59	.61	.63	.82
No. 34	.64	.66	.68	.95
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No 39	2.00	2.02	2.00	2.25
No. 40	2.60	2.62	2.60	2.75

— % discount.

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs—

	Per lb.		Per lb
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	66¢
No. 9	52¢	No. 15	70¢
No. 10	54¢		

60 % @ 5 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to 3½ inches inclusive	17¢ ₩ lb
Over 3½ to 5 inches inclusive	18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

¼ to 3½ inches inclusive	18¢ ₩ lb
Over 3½ to 5 inches inclusive	19¢ ₩ lb

Spelter—

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.	
Western Spelter	5¢@5¼¢
Bertha (pure)	8¢@8¼¢

Zinc—

Duty: Sheet, 2½¢ ₩ lb.	
600 lb casks	6¼¢
Per lb	7 ¢

Lead—

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.	
American Pig	4½¢
Bar	4¾¢
Pipe, subject to discount 20%	6¼¢
Tin-Lined Pipe, subject to discount 20%	..1¢
Block Tin Pipe, subject to discount 20%	57½¢
Sheet, subject to discount 20%	..1¢
Old Lead in exchange, 3½¢ ₩ lb.	

Solder—

½ @ ½ (Guaranteed)	13½¢ @ 14¢
No. 1	11¾¢ @ 12¾¢

Prices of Solder indicated by private brands vary according to composition.

Antimony—

Cookson	₩ lb 11¼¢
Hallett's	" 10¾¢@11 ¢

Aluminum—

Duty: 15¢ ₩ lb.

No. 2 grade metal, in ton lots	₩ lb .75
No. 1 (guaranteed to be 98 % pure and over), in ton lots	₩ lb .90
Lots less than 1 ton	10¢ ₩ lb additional

Old Metals—

Prices Paid in New York.

Heavy Copper	₩ lb 9½¢
Light and Tinned Copper	₩ lb 8¾¢
Heavy Brass	₩ lb 7 ¢
Light Brass	₩ lb 6 ¢
Lead	₩ lb 3¼¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14 ¢
No. 2 Pewter	₩ lb 7 ¢
Wrought Scrap Iron	₩ gross ton $13.00
Heavy Cast Scrap	₩ gross ton 9.00
Stove Plate Scrap	₩ gross ton 6.00
Burnt Iron	₩ gross ton 4.00